THE DENTAL PRACTITIONER

monthly journal for the Practitioner and his Staff

VOL. III, NO. 7 MARCH, 1953

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The Dental Laboratories Section of the Surgical Instrument Manufacturers' Association

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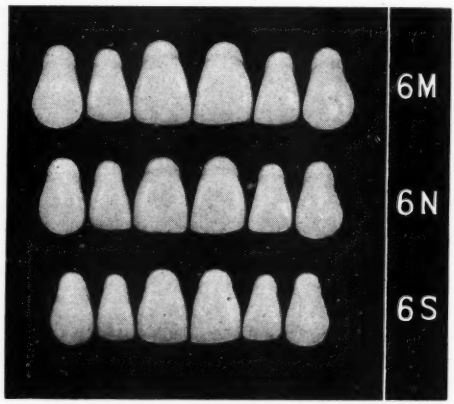

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THE DENTAL PRACTITIONER

A Monthly Journal for the Practitioner and his Staff

(Incorporating the Proceedings of the British Society of Periodontology and the Official Supplement of the S.I.M.A.—Dental Laboratories Section)

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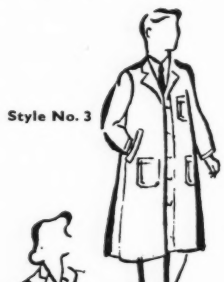

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THE
DENTAL PRACTITIONER
A Monthly Journal for the Practitioner and his Staff

Vol. III, No. 7 March, 1953

EDITORIAL

OSTEOMYELITIS

OSTEOMYELITIS is one of the more serious conditions that the dentist may be called upon to treat. Apparently our problems are not as great as those facing a dentist in the Far East, where it occurs with apparent readiness and spreads in an alarming fashion. With such abundant material much can be learnt about the disease, and the articles from Allwright, of Hong Kong, should help to clarify the ideas on the aetiology and treatment of this disease.

Osteomyelitis is an inflammation of bone caused by pyogenic organisms. It may remain local or spread through the bone to involve the marrow, cortex, cancellous tissue, and the periosteum. The European suffers from this disease to a lesser extent than the Chinese races, and this is possibly due to the fact that the European is better educated, has efficient and prompt treatment of dental sepsis, better nutrition and personal hygiene. Many theories have been put forward regarding the pathogenesis and aetiology of the disease which may be remembered from student days. Before the days of antibiotics the consequences used to be dreaded and the disease could take a serious turn. The side-effects and protracted treatment have been considerably reduced with the aid of penicillin, aureomycin, and the other antibiotics. Despite the value of these antibiotics, however, they should not be relied on entirely as adequate surgical treatment is still of paramount importance. Osteomyelitis, like other diseases requiring surgical treatment, requires careful and skilled attention particularly in assessing the type of treatment at a particular phase of the disease. The disease has to be studied carefully, and it is wrong, for instance, to prescribe heat to the afflicted part when it is in the acute infected stage—a practice still commonly advised by medical as well as dental practitioners.

ARMY DENTAL CORPS MEMORIAL

The "Two Fifty Club" are appealing for funds to endow a bedroom in the Victory Club as a memorial to those officers and men of The Army Dental Corps who gave their lives during the recent war. The appeal is directed to all Officers, N.C.O.'s, and men who served in the corps, who number many thousands and are now scattered throughout the world, in private practice and in laboratories. This call goes out to those who served, in whatever capacity, to help in perpetuating the memory of old comrades. The Victory Club, where the memorial would be placed, is in the words of Mr. Winston Churchill "For ex-service men and women, given by the Nation as a memorial to fallen comrades and as a tribute to those who returned, and stands guardian of the common treasures and memories of friendship and brave deeds".

Details of this appeal are given on page 201.

SUPPURATIVE OSTEOMYELITIS OF THE MANDIBLE

WITH PARTICULAR RELATION TO ITS INCIDENCE IN THOSE OF CHINESE RACE

(*Continued from page* 164)

By **WALTER C. ALLWRIGHT**, H.D.D. R.C.S. (Edin.), L.D.S. R.C.S. (Eng.), D.P.D.

SIGNS AND SYMPTOMS, AND CLINICAL PICTURE

1. Acute Stage.—The early symptoms of acute osteomyelitis vary slightly according to whether the disease is confined temporarily to the periosteum and the immediate subperiosteal cortical bone, or to the cancellous bone. If the former tissues are affected, (following trauma, or from spread from a furunculosis of the chin, for example), then pain and soft tissue swelling are immediately manifest, associated with a very high temperature. If the cancellous bone is first infected, before active infection occurs within and beneath the periosteum, there may at first be no more than a comparatively slight feeling of tenseness and discomfort experienced by the patient. A rapid rise of temperature is to be expected. A diagnosis of acute alveolar abscess is likely to be made, and indeed it may be impossible to distinguish the diseases from a diagnostic point of view. The abscess develops into osteomyelitis. The early acute stage of osteomyelitis differs from early acute alveolar abscess in the severity of the symptoms. Pain is usually more severe, temperature is higher, and the patient usually feels more ill.

Depending on the virulence of the organisms and the resistance of the patient, the infection spreads rapidly. Even a low-grade infection may spread rapidly if the patient's resistance is impaired by systemic disease or undernourishment. The bone rapidly becomes tense and tender, with a superimposed soft tissue swelling and redness. The gum assumes a dark red, angry appearance, and owing to a disinclination on the part of the patient because of pain to lick and suck the tender part, it becomes foul with food remains. The gums may later appear soggy, greyish, and ragged, particularly at socket margins. The breath is extremely offensive.

The cancellous part of the bone in the affected area and the adjacent soft tissues degenerate and liquefy into pus which wells up in infected sockets and from the gingival margins of teeth. The neighbouring teeth become loose.

The gums may be liable to sudden hæmorrhages which are very difficult to arrest. The teeth in the area will be so loose that it will be extremely difficult to apply pressure. Extraction of the loose teeth will facilitate application of pressure pads or splints. Blood transfusion may be necessary.

While the disease is in the acute stage severe pain is a continuous characteristic. Trismus is usual with posterior mandibular infections, and the cheeks become greatly swollen over the infected area. There may be paræsthesia of the lower lip or tongue due to involvement of the relevant nerves.

When acute osteomyelitis attacks the jaws of ill-nourished children, it may develop into the so-called malignant form. This is a rapid and destructive disease. Very soon the bone tissue and periosteum become disintegrated, and gangrenous stomatitis may occur. Thrombosis and septicæmia ensue, and pyæmic abscesses may develop in the liver and other parts of the body. The patient is likely to succumb to a disease of such fulminating character.

2. Chronic Stage.—Acute osteomyelitis does not tend to be self-healing, but a walling-off of the infection usually occurs eventually, and further spread is prevented. The disease then enters on a chronic stage. Chronic osteomyelitis is nearly always secondary to the acute or subacute disease. Mead (1946) describes in some detail a condition which he

calls primary chronic osteomyelitis. This condition is often referred to simply as residual bone infection. He draws attention to the pus formation and occasional bulging or swelling of the buccal or lingual plate which may occur. Round (1936), in commenting on areas of infection described by Mead, remarks that these areas are sometimes undoubtedly the cause of acute "flare-up" leading to osteomyelitic conditions.

Although the present writer believes that (Mead's "primary chronic osteomyelitis" apart) chronic osteomyelitis is nearly always secondary to acute osteomyelitis, it is often impossible to elicit from the patient a clear-cut history of the acute phase. This is particularly so with uneducated Chinese who present themselves with massive necrosis of the jaws, obviously of very long standing, and give a vague history of only a few weeks, beyond which they have no recollection.

The parts of the bone affected by the acute disease will have been devitalized and will continue to degenerate into pus. The pus will discharge through sinuses intra-orally and extra-orally. Intra-oral fistulæ are most commonly formed just below the buccal gingival margins of the teeth, and in the buccal and labial sulci. Discharge also occurs at the gum margins of already loosened teeth. It is rare for the pus to track lingually. Extra-oral sinuses are most commonly formed below the angle of the mandible, below the chin, and in the neck. There is little or no pain, and unless the masticatory disability is severe, there is not much stagnation. The breath is offensive. Temperature may be only slightly raised, and the patient may not complain of feeling ill. Continued ingestion of the intra-oral pus discharge is likely to lower the patient's vitality and deprive him of a feeling of well-being.

After a variable time, usually four to eight weeks after the acute stage has subsided, smaller or larger pieces of necrosed bone begin to separate from the main body. These pieces may present themselves in the mouth or may be discharged through facial or neck fistulæ. Sometimes very large portions of the mandible necrose, and delivery into the mouth in one piece is impossible.

Pathological fracture may occur, or even multiple fractures. Concurrently with the natural attempt to throw off the necrosed bone as sequestra, new bone begins to be laid down within the periosteum which has been originally stripped from the bone by the infective process. When the new bone is laid down around necrosed bone, an "involucrum" is formed, which is so typical of gross osteomyelitis of long bones. When new bone formation is unduly delayed owing to sepsis arising from massive necrosis, great deformity may result, with lack of bony ridge and malrelationship of upper and lower jaws. Necrosis of a mandibular condyle with its subsequent loss causes a swing of the mandible to the affected side on opening. Loss of both condyles will allow the mandible to fall back and bring about a most disfiguring "chinless" appearance. Contraction of scars of the face and neck leads to further deformity. Prosthetic restorations are thus complicated considerably. Great swelling of the cheeks which took place in the acute stage does not usually subside until months after the disease has completely healed.

3. Subacute Spreading Stage.—Acute osteomyelitis will progress towards the chronic stage which, as already mentioned, is associated with little pain, and a temperature only slightly raised. The chronic disease does not spread, and represents a stage of healing with a throwing off of necrosed tissue.

This period of chronicity and healing may be interrupted by a lighting-up of the disease. The cause of this may be a lowering of the state of general health, or trauma, or the presence of an acute infection elsewhere in the mouth, nasopharynx, or antrum. The disease again begins to spread. Most commonly the spread is laterally through the buccal and labial walls of the alveolar process. Multiple sinuses appear at the gum margins and in the gums overlying the labial and buccal aspects of the alveolus. The teeth in these areas rapidly become loose. There is increased fœtor of breath and malaise. The temperature may rise to 100°, but will usually fall to about 99° on hospitalization.

This stage of the disease the present writer calls "subacute spreading" because, although

it is characterized by its power of spread, it lacks several of the signs and symptoms of the acute disease. The patient does not as a rule feel very ill; his temperature is not much raised; his white blood-cell count is not very high; he experiences comparatively little pain, and lacks the intense burning pain of the acute infection. Nevertheless, the infection can spread with remarkable rapidity. Almost overnight it may spread from the canine region on one side of the mandible to the canine region on the other. Early surgical interference is essential to avoid loss of all the teeth and bony alveolus, and much of the body of the bone not previously infected.

Although subacute osteomyelitis is usually secondary to the chronic disease, it may follow directly on the acute stage. Cases are commonly seen in which the subacute stage is apparently primary.

SITES OF INFECTION AND DIRECTION OF SPREAD

1. Since osteomyelitis of the mandible is most commonly associated with odontogenic and pericoronal infection, the most common

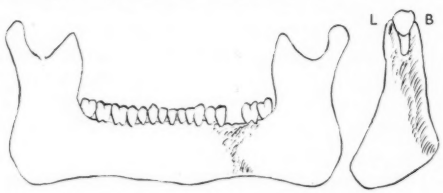

Fig. 1.—Common initial site of osteomyelitis.

site for the disease is to be expected in and around tooth sockets (*Fig.* 1).

Infection often spreads to the alveolus supporting teeth adjacent to the sockets. This is particularly liable to occur when the neighbouring teeth are themselves infected. This is a likely cause of osteomyelitis following what has apparently been a straightforward dental extraction. Sequestration of the tooth socket and of the alveolar process in the area may occur.

2. Beginning around a tooth or tooth socket the infection may spread inferiorly and reach the lower border of the mandible. This inferior direction of spread is usually via the buccal aspect of the bone, and the buccal cortical plate rapidly sequestrates. Sometimes the

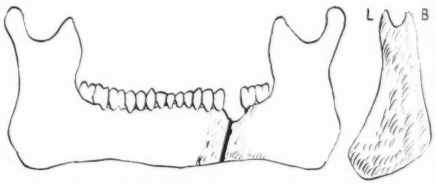

Fig. 2.—Pathological fracture from extension of osteomyelitis.

spread involves so much of the body of the bone that a pathological fracture occurs (*Fig.* 2).

3. Distal and mesial spread in the buccal and labial aspects of the mandible may occur with loosening of the teeth and destruction of the buccal alveolar plate (*Fig.* 3). Destruction

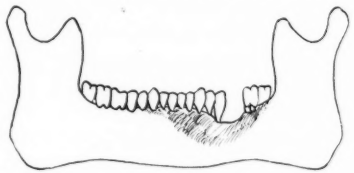

Fig. 3.—Spread of osteomyelitis along buccal and labial aspects of mandible.

of bone on the lingual aspect is not common and is particularly infrequent in the anterior part of the mandible. In one case the only uninfected bone in the body of the mandible was a small triangular area which included the genial tubercles.

4. Spread upwards to the coronoid and condyloid processes is a common occurrence in

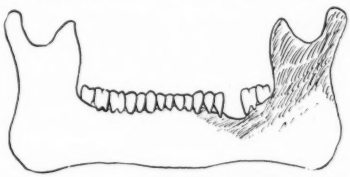

Fig. 4.—Osteomyelitis spreading through the ascending ramus.

Chinese patients, but not in white persons. Either one or the other or both processes may be involved. Of 14 cases of osteomyelitis of the mandible reported by Tratman (1934), 2

involve the coronoid process, 1 the condyloid process, and 4 the whole of the ascending ramus including both processes. Taylor (1949) in reporting a case of osteomyelitis of the ascending ramus in a white patient, states that the reason for the upward spread is probably owing to the thickness of the cortical plates and dense fibrous overlying tissue so that the destructive process follows the line of least resistance (*Fig.* 4).

5. Occasionally a case is encountered where the only infected area is the lower border of the mandible. No connexion with infected teeth or other septic areas in the mandible can be detected. Hankey (1938) mentions this as a common site for sequestration but offers no explanation as to why this is so. Kallenberger (1949) says that osteomyelitis caused by continuity, that is, from infective processes in the neighbouring soft tissues, affects mainly the cortical bone. Hence shell-shaped sequestra may be formed on the buccal plate or lower border without infection of the alveolar processes and so without loosening of teeth.

The present writer believes the following to be the usual process. The infection may begin, as usually happens, within the alveolus, arising from an apical abscess or pericoronal infection

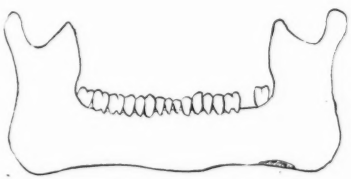

Fig. 5.—Localized osteomyelitis on lower border of mandible.

of a third molar. In the acute stage the infection tracks downwards under the periosteum covering the labial aspect of the body of the mandible, and spreads along the lower border. A fistula on the neck may or may not be formed. The infection subsides in the alveolus after treatment by extraction or incision, and the stripped-up periosteum, as soon as no more pus drains down, re-apposes itself to the bone and resumes its functions before necrosis has occurred. The infection of the lower border then becomes quiescent. After some weeks or months, radiographs of the area show "peeling" of pieces of cortical bone, yet with no signs, radiological or clinical, of infection elsewhere in the mandible (*Fig.* 5).

Residual infection of this character may occur in the mental region. Chinese children seem to be particularly liable to infection here, and in such cases it is usually associated with the crypts of the unerupted canine teeth.

6. Finally, the whole mandible may sequestrate in one part or in pieces. Tratman (1938)

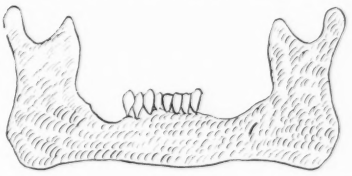

Fig. 6.—Osteomyelitis infecting the whole mandible.

reports a case of a Chinese boy whose whole mandible had necrosed. The massive sequestrum was removed extra-orally (*Fig.* 6).

DIFFERENTIAL DIAGNOSIS

This presents little difficulty except with regard to acute alveolar abscess. The distinction is really only one of degree. The signs and symptoms of acute alveolar abscess and acute osteomyelitis arising from an infected tooth or tooth socket are more or less similar. Pain, swelling, liquefaction of bone, stripping, of periosteum, soft tissue sloughing, loosening of neighbouring teeth, fœtor of breath, rise in temperature—all these are to be expected in both diseases. Spread of the infection is an important diagnostic pointer. The full-scale development of osteomyelitis following acute alveolar abscess is usually avoided by the early establishment of adequate drainage, either naturally or by surgical methods. Nevertheless, small sequestrum formation following acute abscess is common.

Other diseases from which osteomyelitis must be distinguished are as follows:—

1. *Malignant Neoplasm.*—History, X-ray, and biopsy should serve to diagnose sarcoma or carcinoma.

2. *Actinomycosis.*—Microscopical examination of the discharge with observation of the multiple scarred fistulæ, together with a careful history, should be adequate for distinction.

3. *Tuberculosis.*—There may be tuberculous osteomyelitis or a superimposed tuberculous lesion on the ordinary suppurative osteomyelitis. Chest X-ray and laboratory examination of pus and sputum are important.

4. *Syphilis.*—Gumma of the mandible is rare. Observation that the areas of ulceration are localized and are not seen to spread laterally, or only very slowly, together with the usual serological tests, are diagnostic.

5. *Cysts.*—Infected cysts of various kinds may be confused, but a careful history, together with X-rays, should lead the way to a correct diagnosis.

6. *Osteitis Fibrosa Cystica.*—This is a rare disease which should be borne in mind. It may be diagnosed by clinical, radiographical, and pathological examinations. X-ray films of cases of osteomyelitis will often present appearances simulating osteitis fibrosa cystica.

7. *Chemical Necrosis.*—This occurs but rarely these days. Examination of the nature of the sequestra, and careful history-taking should disclose the cause.

8. *Irradiation Necrosis.*—A ready history of radium and deep X-ray therapy will be elicited, although cases of irradiation necrosis have been reported from the licking of their brushes by luminous dial painters (Martland, 1931).

COMPLICATIONS

These may be divided into (1) Local; and (2) General.

1. Local.—

a. Collections of pus may form in the adjoining soft tissues of the mandible.

b. Sinuses may form with discharge of pus on the cheeks and neck. These may dry up from time to time in the chronic stage of the disease, and break down intermittently.

c. Any of the salivary glands draining the area of infection may break down and suppurate, forming abscesses in the neck.

d. Teeth may become involved and lost by spread of the infected areas of bone.

e. Trismus is a common complication caused by the muscles of mastication and the nerves supplying them becoming inflamed.

f. Cellulitis of the surrounding soft tissues including the cheek is likely to occur.

g. A trigeminal neuralgia may be caused with or without paræsthesia of the lip or tongue caused by extension of the infection to the sheath of the inferior dental and lingual nerves.

h. Pathological fracture may occur.

i. Ludwig's angina may complicate the bony disease, but provided that adequate drainage is established early, and large doses of antibiotics are given, the risk of such a complication is slight.

j. Thrombosis of the cavernous sinus is a rare but very serious complication which is likely to have fatal results. Again, early adequate drainage will almost certainly prevent any danger of such a spread of infection. Rare as such a condition is in this country, Salama (1941) in Egypt reports three or four deaths from thrombosis of the cavernous sinus out of 300 cases.

k. Ankylosis of the temporomandibular joint may occur. It is likely following osteomyelitis of the condyle in a child, when the condition will be associated with a small mandible owing to the interruption or complete arrest of normal development and growth.

l. Severe cases of osteomyelitis will lead to much deformity occasioned by bone loss and scarring with contraction of tissue following facial and neck abscesses, and to loss of masticatory function not readily corrected by the fitting of prostheses. Loss of a condyle will cause deviation of the mandible.

2. General.—

a. Generalized septicæmia may occur with the formation of abscesses in remote organs such as the liver, kidneys, or heart, or with infection of other bones. This is particularly liable to occur in undernourished children.

b. Pneumonia may develop following the inhalation of septic material from osteomyelitis of the mandible. This is a real danger during the induction of anæsthesia and the passing of an intratracheal tube, when the mouth and nasopharynx may be constantly bathed in pus.

(*To be continued in our April issue*)

A MODIFIED STRESS-BREAKER

By **H. J. TURKHEIM**, D.M.D. (Hamburg)

A NATURAL tooth serving as an abutment for metal clasps is exposed to vertical and horizontal forces if these clasps are rigidly attached

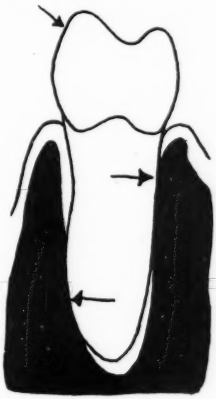

Fig. 1.—Diagram showing direction of forces on a tooth, tending to loosen the tooth.

to the denture. The forces can be transferred from the crown to the alveolar socket. Consequently the tooth can be loosened (*Fig.* 1).

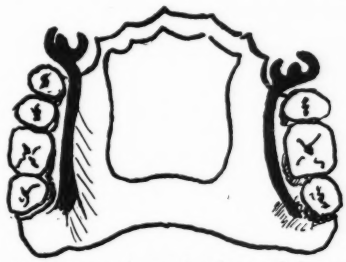

Fig. 2.—Diagram of stress-breakers and clasps ($\overline{3}|\overline{4}$) on free end of saddle denture.

Various appliances have been designed to alleviate the stress thus imposed upon the teeth serving as abutments. In *Figs.* 2 and 3 two of the less complicated types of stress-breakers are shown, which serve as elastic retainers, especially in free-end saddles. In *Fig.* 2, $\overline{3}|$ carries a circumferential clasp with palatal rest; a free arm loosely resting on the denture is fixed near $7|$, thus procuring ample elasticity. The stress-breaker on the left side is similarly constructed, with $|\overline{4}$ acting as abutment. *Fig.* 3 describes a lower denture, where $\overline{765}|\overline{567}$ are missing. The stress-breaker is constructed in such a way that two circumferential clasps are acting on $\overline{4}|\overline{4}$, being connected by a lingual bar which is clear of the

Fig. 3.—Clasps and stress-breaker on lower denture ($\overline{4}|\overline{4}$).

denture, with the exception of the centre. By the elasticity of this appliance horizontal forces will to a great extent be kept away from the teeth which act as abutments.

The author wishes to describe a modified stress-breaker which is easily constructed and which warrants longer use of abutment teeth, especially in dentures bearing free-end saddles.

Fig. 4.—Aluminium foil loosely wrapped around the free wire arm to show the process. In practice the foil has to be tightly adapted to the wire, thick enough to allow for free movement after removal of the foil.

TECHNIQUE

When the try-in is completed, the circumferential clasp is bent, a long wire (0·9 mm.) from the same material is soldered on vertically and adapted in such a way that it almost

rests on the model longitudinally—horizontally. A bayonet-like appearance will result. Any hard, elastic, round wire will suit this purpose. In the next step the free arm will be wrapped tightly in thin aluminium foil, such as used

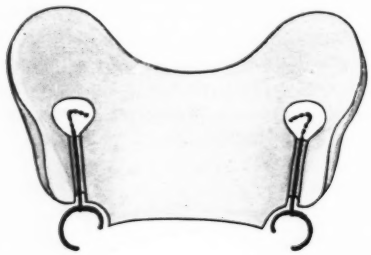

Fig. 5.—The wire arm is fixed by its loop-end inside denture base (*dotted line*); otherwise it is freely movable inside the open channel. The circumferential clasps are kept clear of the denture.

for packing cigarettes (*Fig.* 4). The other end of the wire arm has to be bent and kept free, as this acts as retention inside the denture material. This appliance clasp and aluminium-wrapped wire arm, plus retention loop, will be adapted to the plaster model, and the waxed try-in has to be put into the correct position on the model, enough wax having been removed first for the reception of the clasp appliance. Where necessary the artificial teeth have to be filed out from underneath. The retaining loop should be safely secured inside the wax plate (*Fig.* 5). After curing the plastic resin, or vulcanizing, the aluminium foil can be dissolved easily by one drop of hydrochloric acid, leaving the wire arms in a tunnel, or channel, which opens towards the gum. The circumferential clasp has to be kept clear of the neighbouring

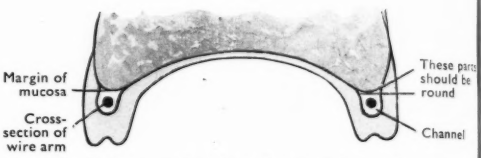

Fig. 6. Cross-section through arm and tunnel.

artificial tooth, else the elasticity of this appliance might be impaired. In *Fig.* 6 it can be seen that the free arm carrying the clasp is clear of the gum.

It cannot be avoided that the recess which facilitates the elasticity of the wire arm is filled with food debris. Consequently the patient has to be warned, when cleaning the denture, to take special care and to use brush, soap, and water freely. He will find floss silk very useful for removing matter which may cling to the off-side of the wire arm.

ANGULAR CHEILOSIS

By **J. PITCHFORD SMITH,** B.Ch.D., L.D.S. R.C.S.

Lecturer in Dental Mechanics and Prosthetics, University of Sheffield

CASE REPORT

The patient, a married woman, aged 49, attended in March, 1952, complaining that for some twelve months she had had painful cracks at the corners of her mouth. As her fingers and nose also tended to crack and be sore, she had consulted her doctor, who had prescribed vitamin therapy and penicillin ointment for the local lesions with no improvement.

Four years previously she had been fitted with full upper and lower resin dentures, but before this had worn full upper and partial lower vulcanite dentures (Kennedy, Class I) for twelve years. The upper denture was not removed at night. The cleansing agent was hydrogen peroxide.

On examination, the lower alveolar process showed excessive resorption. There was an abnormally large muscle attachment in the $\overline{45}$ region which extended almost to the crest of the ridge, and this frænum tended to guide saliva to the corner of the mouth. The upper alveolar process showed soft tissue anteriorly, which may have been caused by the original vulcanite dentures. The mucous membrane of the mouth was slightly hyperæmic. The dentures showed a slightly closed vertical dimension.

In view of the therapy previously instituted by the patient's doctor, it was felt that the angular cheilosis might be due to the reduced vertical dimension and new dentures were constructed to correct this fault. An effort was made to eliminate the escape of saliva at the left corner of the mouth. A carefully muscle-trimmed lower impression was taken and the lower denture was extended around the muscle attachment.

Shortly after the insertion of new dentures the cracks at the angles of the mouth almost disappeared. This improvement was only temporary, however, and coincided with warm weather, when the patient stated the condition was always less severe. After six months the original condition had returned (*Fig.* 1).

The vertical dimension was again increased and the canine prominences built out considerably in an attempt to stretch the tissues at the corners of the mouth. After three months, however, little improvement was noted. The patient was then referred to the Department of Medicine, where a blood-count revealed a moderate iron-deficiency anæmia, and iron (Fersolate) was prescribed.

At the end of a month the patient's hæmoglobin was normal and the cracks at the angles of the mouth, the fingers, and nose had healed completely. The patient continued to take iron one week in each month and the improvement has been maintained.

DISCUSSION

Cracking at the angles of the mouths of denture wearers has been ascribed to many causes by various authors—riboflavine deficiency (Sebrell and Butler, 1938), ill-fitting dentures (Ellenberg and Pollack, 1940), iron deficiency (Darby, 1946), and sensitization to denture base material (Vickers, 1949). Mann, Dreizen, and Spies (1948) correlated nutritional and mechanical factors and local infection, or a combination of these factors, pointing out that their observations in no way altered the necessity for vitamin therapy in properly selected cases.

The writer feels that when a patient presents with angular cheilosis a most careful examination of all possible causes, medical and dental, of the complaint should be made. The possibility of the condition being the result of a combination of the causes mentioned above must also be considered.

Fig. 1.—Typical case of bilateral angular cheilosis.

The above case serves to illustrate the fact that vitamin therapy does not necessarily embrace all nutritional deficiencies.

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PARLIAMENTARY NEWS

School Dental Service

An assurance that the School Dental Service would not, at some time in the future, "all wither away" was given by Miss Florence Horsbrugh, Minister of Education, on Thursday, Feb. 5.

Speaking during the House of Commons Standing Committee's consideration of the Education (Miscellaneous Provisions) Bill, she said: "In the past I have often been asked whether it is worth while for dentists, or those qualifying to become dentists, to go into the School Dental Service since it might all be given up.

"I want to make it perfectly clear that we mean to have this service and mean to make it better. I want to assure those already in the dental profession, or who are becoming qualified, that this service will be carried on, and that we want to improve it, so that they shall not think it would be dangerous to enter a service which might wither away.

"My point in bringing forward this Bill is to make it clear that we want a School Dental Service and that we shall do all we can to assure those coming into it that the service is going on and, we hope, will be built up. Indeed, I sent out a circular to the local authorities saying that we wanted them to make a real effort to build up their service and to recruit more dentists."

Capt. T. F. Peart (Lab., Workington) asked for a firm assurance that no economies would be inflicted on the School Dental Service. He

pointed to the case of Northants, in whose estimates, he said, there was a cutting down, and a figure of £1,552 was given for drugs, medical requisites, and apparatus.

Miss Horsbrugh replied that a circular went out in June urging local authorities to do all they could to recruit more dentists. "There has never been the slightest suggestion that there should be an economy or a cutting down."

Mr. John Baird (Lab., Wolverhampton N.E.) welcomed the Bill because, for the first time, the onus was placed upon local authorities to provide an adequate and comprehensive School Dental Service. In the past it was left to the local authorities and in some areas there had been a very efficient service, while in others it had been almost non-existent.

"I know of cases, especially in rural areas, where a dentist has had to carry out inspection of schoolchildren in a cloakroom, and in other areas he has been provided with no running water", he continued. "Very often, too, the equipment is out of date and inefficient. Consequently any Bill which seeks to place the onus on the local authority to provide an efficient service should be welcomed."

Mr. J. Chuter Ede (Lab., South Shields) said the problem of giving dental treatment to children in village schools was rather more difficult than the treating of town children.

There were local authorities which had devised a travelling dentist service and he hoped that type of service would be extended.

If the travelling dental chamber went to one village school it should be possible to arrange for children from surrounding schools to be taken along to it, to make the maximum use of the equipment. (*Th.*, *Feb.* 5.)

LETTERS TO THE EDITOR

Seating Abutment Dies

Jan. 17, 1953.

To the Editor,
Dear Sir,

I have read and enjoyed the many articles of your contributor, E. A. Schoolden, but in the Jan., 1953, issue his account of the method of seating abutment dies into the wax squash bite should not pass without some comment.

On no account should an abutment die be inserted into a wax squash bite until the opposing side of the bite has been cast. The casting of a model into the opposing side of the wax bite before attempting to seat the die is necessary, to ensure certain and firm seating, quite apart from the fact that these wax bites are fragile and prone to warpage.

With regard to the gagging when the finished restoration is inserted, there are three main causes: lack of complete closure of the jaws during bite taking; laxity in seating the abutment die into the wax squash bite; or the natural tendency of a prepared tooth to erupt into occlusion again with its opposites.

The second of the above causes is unfortunately linked far too often with the point made in this letter concerning which half of the wax squash bite should be cast first.

Yours, etc.,

R. WILLIAMS.

22 *Barnfield*,
Iver, *Bucks.*

Æsthetics and Health

Jan. 29, 1953.

To the Editor,
Dear Sir,

Regarding the refusal of estimates for crowns on anterior teeth for æsthetic reasons, I notice that your correspondent W. McClelland (DENTAL PRACTITIONER, January, p. 147) states that the Health Service is, as its name implies, a health service. I would suggest that the view of health that excludes æsthetics is surely a narrow one, but if we look on the individual as an entity, with the physical, pyschological, and physiological condition making up that entity, then we are not in danger of minimizing the effect on the individual of an unsightly anterior tooth.

If we are honest, we as a profession must admit that apart from relief of pain our

greatest appeal to the public is on æsthetic grounds, and one has only to see the embarrassment caused by one ugly incisor in an otherwise normal person to realize that if indeed there is to be a health service, then a broader interpretation of the word must be adopted.

Yours etc.,
F. M. CHARLTON.

29, *Church Street*,
Durham City.

White Bread

Feb. 10, 1953.

To the Editor,
Dear Sir,

In your February editorial you say that nobody knows why the natural goodness of flour has to be removed and artificially replaced.

In the days of stone-ground flour the vital element, the germ, was always left in the flour whatever the extraction rate. Unfortunately, the steel roller mill does not permit of the same happening; it does not grind the berry as the stone mill did but strips it of its outer covering and then bursts it open, squeezing out the soft, starchy content.

Mr. Kent-Jones, of the British Flour Millers' Research Association, said in a lecture to the Royal Society of Arts two years ago: "What happens to that important part of the grain, the germ, and particularly to the protective covering of the germ, the scutellum? . . . Few people realize that, although as much of the germ as possible is now retained in the flour-sack, by no means all of the germ finds its way there. Always, even to-day, the bulk of the germ becomes disintegrated and still appears in the offal. It is difficult to see how this can be prevented in modern mills. Even when the extraction is as high as 85 per cent the more important portion of the grain from a vitamin point of view—the scutellum—tends to congregate in what are called the lower reductions".

Recent research into chlorine dioxide, as an alternative improver to agene, shows that chlorine dioxide treatment of flour further reduces its vitamin E content (*Nature*, 1953, Jan. 17).

Common sense would suggest a return to the well-tested ways of our fathers—stone-grinding and natural ageing of flour.

Yours etc.,
WINIFRED M. SYKES.
(*Vice-Chairman*,
British Housewives' League.)

2, *Stepney Green*,
London, *E*.1.

SOCIETY NOTES

THE TWO FIFTY CLUB

THE Seventh Annual Reunion Dinner of The Two Fifty Club was held on Saturday, Jan. 31, 1953, at The Victory Club, Marble Arch, W.2. The principal guests were Surgeon Rear-Admiral (D) F. R. P. Williams, C.B.E., Director of Dental Services of the Royal Navy and his Deputy Director, Surgeon Commander (D) W. Mountain, O.B.E.

Following the toast of "The Queen", the President, Brigadier R. A. Broderick, D.S.O., M.C., T.D., made reference to the recent appeal to dental officers who had served with The Army Dental Corps during the last war, to endow a bedroom at The Victory Club as a Memorial to those from amongst them who fell serving their King and Country. He mentioned that it had not been possible to trace all who had served, and asked those present to bring the appeal to the notice of any they knew who had not received an appeal leaflet. The appeal had reached a total of £185 19s. towards the £750 target. Our President then proposed the toast of "Our Guests" and congratulated Surgeon Rear-Admiral (D) F. R. P. Williams, C.B.E., upon his recent promotion to that rank and also congratulated Surgeon Commander (D) W. Mountain upon his receiving the O.B.E. in the New Year Honours. A hearty welcome was extended to all the guests and Rear-Admiral Williams was

called upon to reply. In referring to the foundation of The Two Fifty Club in 1946, he considered that the club had given and would continue to give a useful service in bringing together again those who had served in the last war. He said that he and his fellow guests of the R.N.V.R. had thoroughly enjoyed The Two Fifty Club Navy Night. Rear-Admiral Williams then proposed the toast of The Two Fifty Club and called on all present to drink to its successful future. Major C. R. H. Fenton, Chairman, in his reply, said how pleased all were to have had the opportunity of entertaining our colleagues of the Senior Service, how pleased all were that our guests had enjoyed themselves, and that it was hoped to entertain the R.A.F. at the 1954 dinner.

The Secretary, Major J. W. Cooper, then gave a brief outline of the work done in the past year. He announced that nearly 1800 appeal leaflets had been sent out but there were many more he had not been able to trace. Leicester and District held a very successful reunion in November, all the arrangements being made by Captain T. L. White. Several London members promised to visit Leicester's next dinner. New branches were to be formed. Captain C. E. Chapman, Belfast, is to organize Northern Ireland, Captain G. M. Brander, T.D., the Manchester and Liverpool Districts, and Major N. W. A. Holland the Wolverhampton District. Volunteers to undertake the secretarial duties in other districts are required. This outline concluded the serious part of the evening and all then formed into small parties to have a drink together and talk of old times.

a. Membership of The Two Fifty Club is open to Territorial Army, Short Service and War Emergency officers who served with The Army Dental Corps during the last war. Dental officers who served with

Commonwealth Forces are eligible for Associate Membership.

b. Leicester and District hold their next reunion dinner on Friday, Nov. 13, 1953.

c. The next Two Fifty Club dinner will be held on Saturday, Jan. 30, 1954, when it is hoped to entertain the R.A.F.

There are probably many reading these notes who served as dental mechanics and dental orderlies with The Army Dental Corps and who would like to associate themselves with the appeal to endow a bedroom at The Victory Club as a Memorial. Please send donations to the Hon. Secretary, Major J. W. Cooper, 726, Fulham Road, London, S.W.6.

INSTITUTE OF BRITISH SURGICAL TECHNICIANS (INC.)

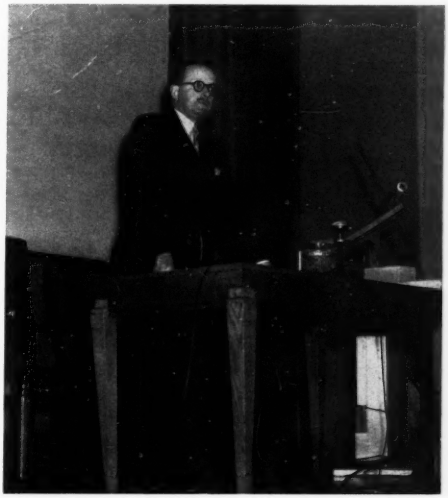
A LECTURE on the "Manipulation of Investment Materials" was given by Professor John Osborne at the Eastman Dental Hospital, on Jan. 20, before a large audience.

After dividing his thesis into two parts—investments used for casting precious metals and those for investing chrome alloys—the lecturer confined his remarks mainly to the first group as a great deal remained to be discovered about chrome cobalt alloys.

The properties an investment material should possess were considered under the headings of consistency, setting time, cracking on heating, expansion at the casting temperature, crushing strength, and porosity. Professor Osborne then proceeded to enlarge upon these, making reference among many other points to the composition of investment materials, factors arising from variations in the proportions of the various constituents, the use of the vacuum investment technique, various types of expansion and the factors giving rise to them, the latter being illustrated by a number of diagrammatic slides.

Although basically the same fundamental properties were required in investments for chrome alloy castings, there were slight differences in detail—the use of the vibrator, for example, had to take the place of the vacuum investing technique; there were differences in particle size and crushing strength, and a longer setting time was required.

A number of questions were put to Professor Osborne and the proceedings were finally



Professor Osborne delivering his lecture.

brought to a close by the Chairman, Mr. J. R. Boswell, who expressed appreciation of Professor Osborne's excellent address and his willingness to spare the time to lecture to the Institute in the midst of his many other activities.

FEDERATION DENTAIRE INTERNATIONALE

Fortieth Annual Meeting

To be held at Oslo, Norway, July 26 to Aug. 1. 1953

THE following are the preliminary details of the Meeting to which it is urged that all members should send Delegates, Alternate Delegates, and Observers, whose names should be sent to the Secretary General at 35, Devonshire Place, London, W.1., as soon as possible.

Headquarters Hotel: Hotel Bristol; Place of Meetings: Oslo Handelstands Hus; Place of Council Meetings: Offices of the Norske Tannlaegeforening.

Provisional Programme.—

Sunday, July 26, Meeting of the Council; Informal Reception, Hotel Bristol.

Monday, July 27, Official Opening; General Assembly; Probable Reception at Oslo Town Hall.

Tuesday, July 28, Meetings of the Commissions.

Wednesday, July 29, Meetings of the Commissions; Report on Fluoridation with Reporter from U.S.A. and Openers from Switzerland and France; Probable Reception at Akershus Castle.

Thursday, July 30, Excursions with Lunch given by the Norwegian Dental Association.

Friday, July 31, Meeting of the Council; Report on Public Dental Services by Dr. Ramm (Oslo), to be followed by debate; Banquet, Hotel Bristol.

Saturday, Aug. 1, General Assembly.

Sunday, Aug. 2, Council Meeting.

Accommodation.—List of Hotels with information of their charges will be sent by Dr. K. Gard (Secretary: Den Norske Tannlaegeforening, 17 Incognitogatan, Oslo, Norway). Members are kindly requested to make their reservations personally, either directly to the Hotels or through their Travel Agencies, as the Committee cannot take any responsibility regarding this matter.

BOOK REVIEWS

PHYSIOLOGY FOR DENTAL STUDENTS. By D. J. ANDERSON, M.Sc., B.D.S., Senior Lecturer in Physiology, Guy's Hospital Medical and Dental School, London. $5\frac{1}{2} \times 8\frac{1}{2}$ in. Pp. 344 + viii, with 141 illustrations. 1952. London: Edward Arnold & Co. 30s.

THIS book is to be recommended as a text-book of physiology for dental students and may be read with profit by medical students at the start of their course in physiology. Instead of the routine treatment of the subject so often to be found in short text-books, the author has endeavoured to provide the reader with a wide view of the subject by dealing with it under five broad headings. In this endeavour he has been successful. Unfortunately, in presenting the subject in this way, the good student and even the mediocre student will benefit, but those who are potentially less successful have not the ability to make full use of any but a routine approach to the subject. This difficulty could only be remedied by some form of seminar teaching.

Part V, entitled "Studies in Physiological Integration", deals with admirably selected topics, and the inclusion of chapters on "Pain and Anæsthesia" and "Repair" in Part III is to be commended in a book of this sort. There are a few typographical errors in the text and the index could be improved by more cross-references (e.g., "Cardiac output" appears in the index, but not "Heart, output of"), but these defects are trifling.

J. D'S.

ORAL ANATOMY. By HARRY SICHER, M.D., D.Sc., Professor of Anatomy and Histology, Loyola University School of Dentistry, Chicago College of Dental Surgery. Second edition. $6\frac{7}{8} \times 10$ in. Pp. 529, with 310 illustrations. 1952. London: Henry Kimpton. £5.

THE main fabric and pattern of the second edition of this well-known text-book have been little altered during its revision. A number of corrections, additions, and alterations in nomenclature have been made throughout the text, but there can still be some quarrel with the labelling of a number of illustrations.

Undoubtedly the most illuminating and interesting section of the book is concerned with bone growth and growth changes in the skull and jaws. On these subjects, and also on the temporomandibular joint, a section which has, incidentally, been altered and enlarged, the author has a valuable contribution to make to our knowledge. The reader

will find a clear description of many fundamental concepts, together with Professor Sicher's authoritative views on their importance. It is to be regretted, however, that there is so little reference to embryonic and fœtal life. The study of the embryology of the head and neck is the most useful explanatory guide to its topography and to the abnormalities which may be encountered. There are, indeed, a number of references to developmental processes, but not necessarily by way of elucidation of structure; for example there is no attempt to correlate the nerve-supply of an organ, such as the tongue, with its developmental history. The problem of the development of certain skull bones is hardly considered, and it is unfortunate that the sphenomandibular ligament is derived from Meckel's cartilage and not from the sheath of that cartilage.

Throughout the book there is an admirable blend of form and function, with valuable comments, though perhaps too infrequently, on phylogenetic considerations. Important practical points are stressed, and in the latter part of the book they are expanded in the useful chapters on minor surgical procedures.

It is debatable whether this book is of use to the undergraduate student of this country or whether its real value is restricted only to the postgraduate student. There is certainly much in the book which it is essential for every student to know, but the degree of detail, and, unfortunately, the price, may influence the undergraduate to seek his information in a slimmer volume.

R. J. H.

ORAL SURGERY. By KURT THOMA, D.M.D., Professor of Oral Surgery, and Brackett Professor of Oral Pathology, Harvard University. Second revised edition. $6\frac{1}{4} \times 10$ ins. In two volumes. Pp. 1688, profusely illustrated. 1953. London: Henry Kimpton. £11 5s.

SINCE its first publication in 1948, *Oral Surgery* has been known as the standard text-book on oral surgery throughout the world and is recognized as such by all the oral surgeons. *Oral Surgery* is a clinical book, dealing principally with the science and art of oral surgical procedures, and the text encompasses the operations which are considered to comprise the field of the oral surgeon. The two volumes, containing nineteen chapters, supply information that all oral surgeons would like to have.

In its second edition the book has a separate chapter on local and general anæsthesia, which includes important additions. Chemotherapy and antibiotic therapy to-day play such an important role in the practice of surgery that a separate chapter has been devoted to them. The chapter on the general care of the patient has been enlarged and therefore is more comprehensive and up to date. Abnormalities of the edentulous mouth and the combined oral surgical prosthodontic problems are considered in a separate chapter. New procedures have been included in the chapter dealing with the surgical correction of developmental deformities of the face and jaws.

Two additional chapters also include the treatment of the acquired jaw defects and surgical deformities requiring restoration by means of grafts, as well as the treatment of all abnormalities and defects such as oro-nasal and oro-antral perforations. Many case reports and illustrations have been replaced and there has been a re-organization of the text.

This book should be used in conjunction with *Oral Pathology*, which gives in greater detail the aetiology, pathogenesis, and the morbid anatomy and histology of the region dealt with by the oral surgeon.

These two volumes should prove invaluable to students and practitioners as they provide the most complete information on the speciality of oral surgery which only a master oral surgeon like Thoma can give. Not only oral surgeons, but students and practitioners alike, should find a place of honour on their bookshelves for this very worthy book.

Both the author and the publishers are to be congratulated on publishing this excellent book in its new guise.

H. M.

THE PROCEEDINGS OF THE BRITISH SOCIETY OF PERIODONTOLOGY

President: G. H. LEATHERMAN, F.D.S. R.C.S. Eng.

Hon. Secretary: H. THOMSON, L.D.S. R.F.P.S. Glasg., H.D.D. R.C.S. Edin.
53, Portland Place, London, W.1.

Vol. III, No. 4 March, 1953

A SURVEY OF PERIODONTOLOGY IN U.S.A. AND CANADA

By **W. G. CROSS**, M.B., M.S., B.D.S.

Senior Lecturer and Head of Department of Periodontology, Institute of Dental Surgery, Eastman Dental Hospital

MAY I say at the outset how honoured I feel at being asked to give this paper on my recent visit—a visit made possible by a generous grant from the Nuffield Foundation.

I commenced my tour with the meeting of the American Academy of Periodontology in September, which lasted for three days. The first morning was taken up with business meetings and reports of committees, and during one of these I gave the President, Dr. Aiguier, a message from our own President, and was very warmly welcomed to the meeting of the Academy. I was in turn asked to convey the most cordial greetings from the American Academy of Periodontology to the British Society of Periodontology, and was further told that they would be glad to help us in any way they could. At a subsequent meeting with Dr. Chamberlain, the Secretary, and Dr. Hine, the Editor of the Journal, Dr. Hine kindly promised to let the Society have such back numbers of the Journal as he could spare.

In the afternoon three papers were read (American: "three presentations were given"). Two of these were of particular interest—one, by Dr. Goldman, on "Present Concepts in the Treatment of Periodontal Disease", and the other, by Dr. Jankelson, entitled "The Physiology of the Masticatory Mechanism". Dr. Goldman stressed the importance of preliminary scaling before carrying out other surgical procedures. He mentioned the need for care when operating on the incisive papilla on account of the cartilage sometimes encountered in the incisive canal. He asserted that gingivectomies performed in the presence of calculus healed slower and less satisfactorily; this finding was corroborated by many other eminent periodontists. Dr. Goldman was most insistent that proper bevelling and contouring, producing a good architectural form at the time of operation, is of utmost importance.

Dr. Jankelson showed a most interesting example of cinefluoroscopy, showing the movements of the mandible and the relationships of the teeth during the act of mastication. He pointed out that the teeth, as a result of proprioceptive impulses, make oscillatory movements when chewing, and rather than endeavour to meet with a bump when chewing through tough foods, try and avoid each other. The function of teeth is to chew *food*, not teeth. The teeth in fact, only make contact after the third or fourth chew.

The next day the problem of occlusal equilibration was discussed by Drs. Lauritzen, Jankelson, and Schuyler. Dr. Lauritzen uses check centric and protrusive bites in his bite registration technique, and a hard tin-reinforced wax. This, however, was directly contrary to what most workers use.

Dr. Jankelson showed some ground sections, demonstrating that the enamel was thinner in unerupted teeth on the buccal slopes of upper cusps and the lingual of lowers, and advised against grinding these—in fact he advocated the opposite. This has not gained general support. He uses strips of 30-gauge wax, adhesive on one side, for determination of premature

contacts. Dr. Schuyler, in summing up, fully supported the need for mounted study models as an aid to diagnosis. He expressed doubt about the term, used earlier in the discussion, "exact axis of rotation". He asserted that no two men will find exactly the same point. He criticized the use of tin foil in the wax bites, as advocated by Dr. Lauritzen, because one cannot see whether contact is made. He suggested the use of cellophane or gauze, and advised the use of warmed *soft* wax in arch form.

During the afternoon there were short papers on oral manifestations of systemic disease by Dr. Burket, the interdental alveolar bone crest by Dr. Ritchey, and a most interesting piece of original work by Dr. Zander, of Minneapolis, on the method of attachment of calculus to cementum. Dr. Zander, who is widely known for his work on endodontia, has taken over the Department of Periodontology at Minneapolis, and is going to make most valuable contributions in periodontology. The present work showed that attachment took place in four ways:—

1. Bacterial ingrowth into the dental cuticle.
2. Mechanical attachment to irregularities of cementum.
3. Bacteria growing into cementum.
4. Calculus forming in resorption areas of cementum.

The calculus matrix was found to consist primarily of *Actinomyces* organisms. It was found that no cases showed evidence of attachment by methods (1) or (4) only, while many cases exhibited attachment by method (2), some by (3). It was also found that in the majority of cases attachment took place in two or more different manners, and these were itemized.

In all probability this and other papers presented will be published in the *Journal of Periodontology*.

Following Dr. Zander's paper, the Histopathology Study Club of Colorado Springs Dental Foundation gave a symposium of six brief communications. Dr. Foss, discussing gingivosis and lichen planus, points out that Orban considers the former a better term than desquamative gingivitis, and drew attention to the presence of lymphocytes and absence of plasma cells in lichen planus. Dr. Nabers, speaking on leucoplakia, emphasized the presence of plasma cells.

That evening the annual banquet took place; it felt a trifle strange, as one of the guests at the top table, to march in to the tune, I think, of Colonel Bogey! I was later asked to say a few words, and took the opportunity to emphasize how welcome any members of the Academy visiting Europe would be at meetings of our own Society. For those who have had experience of American hospitality, it will be unnecessary for me to explain the friendliness and generosity I encountered everywhere I went.

The next morning two hours were devoted to a round table discussion on traumatic occlusion in periodontal disease. Dr. Thomas, of Seattle, acted as moderator, and was obviously concerned to prevent a free fight! The participants, who were strictly limited to ten minutes each, were Drs. Goldman, Jankelson, Lauritzen, Orban, Schuyler, and Fox. There was general agreement that Drs. Goldman, Orban, and Fox presented the matter particularly well and fairly. The views were as follows:—

1. *Dr. Orban*: Trauma gives rise to compression, necrosis, and thrombosis on the pressure side; bone apposition on the tension side; and ultimately mobility, especially in cases of cusp interference. He does not consider it to be a primary cause of periodontal disease, and holds that one cannot say that periodontal disease can be prevented by correction of occlusion. Gingival recession, Stillman's clefts, and McCall's festoons are not associated with trauma. He considers, nevertheless, that grinding should be carried out in established cases of disease.

2. *Dr. Goldman* pointed out the tissue changes observed—cemental tears, repair, root resorption. Fresh injury gave rise to hæmorrhage, etc. Secondly, he observed that though injuries are constantly being repaired, they are constantly being repeated. If the frequency and severity of the injury are excessive, repair will fail. He lists as signs and symptoms, thickening of periodontal membrane space at

neck or apex, haziness of lamina dura, mobility, heavy facets on the crown, resorption of root or alveolus. He pointed out that in this condition, cause can become effect, and effect cause.

3. *Dr. Jankelson* reiterated what he had said earlier, that in masticatory movement there was very limited tooth contact, and what there was did *not* take place up and down the fossa. Some trauma could take place during swallowing, owing to the bracing of the mandible, but bruxism and perverted movements were of great importance in trauma production. The wear produced in these cases is pathological.

4. *Dr. Fox* divided movements into functional—chewing, swallowing, speaking—and afunctional—bruxism, etc. Traumatism is not a pathological process, but may lead to one. He personally was satisfied if patients could chew adequately, not optimally. Steep inclines should be reduced. Deeply cusped teeth were not necessary, either for balance or for function. He felt there was much to suggest that trauma took place between meals, with forces ten to twenty times greater.

During the afternoon of the last day of the Academy Meeting, a clinical meeting was held. This included several films, Dr. McCall gave a demonstration entitled "Oral Orthopædics and Periodontal Disease", and Dr. Leonard Hirschfeld one on "The Use of Calibrated Silver Points in recording Periodontal Pockets". As I was showing two of my own films, I was unfortunately unable to see these other clinics, though Leonard Hirschfeld demonstrated his silver points privately later. These consist of a series of points of different lengths, of D-section, with annular elevations on the convex side every two millimetres. They are especially of value in recording the intra-bony pocket (*Fig.* 1).

The next week was taken up with the American Dental Association Meeting. About 10,000 dentists attended, and the weather, although almost too hot, was perfect for the meeting. On the Monday I saw colour television both morning and afternoon. It was inferior to the large screen television seen during the London Congress, as only small domestic viewers were used. The next days were spent seeing the Trades Exhibit, a number of table clinics, and hearing a couple of excellent papers concerning the relationship of operative dental surgery to periodontal disease. In addition, there were interesting panel discussions on evaluation of the uses of antibiotics in dentistry, evaluation of the effect of oral focal infection, and premalignant

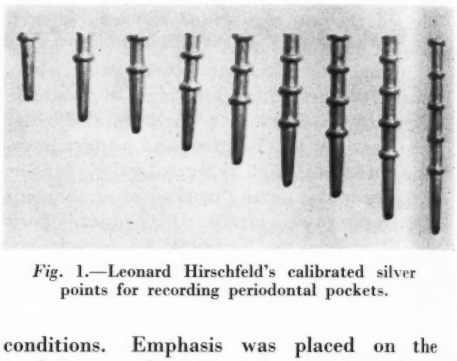


Fig. 1.—Leonard Hirschfeld's calibrated silver points for recording periodontal pockets.

conditions. Emphasis was placed on the tendency to aplastic anæmia, sometimes fatal, with chloramphenicol. Ostrander mentioned the need to be conservative with penicillin for periodontal disease, and found local reaction and sensitization occur in 8–10 per cent of cases. The acute stage of Vincent's infection responds well to topical therapy, especially in severe cases.

A film by Dr. Berliner, taking in many aspects of periodontal therapy, especially curettage, was particularly good. Two papers were presented on the Wednesday—one by Dr. Radusch, of Minneapolis, on nutrition; and the other by Dr. Belting, on the epidemiology of periodontal disease.

After the St. Louis meeting I flew to Kansas City, where I spent a day visiting the Dental School. The building itself is relatively old. Periodontal teaching is carried out by Drs. Enever and Roth, the latter being engaged on research into the problems of the initial lesion in gingivitis, and in particular the liberation of collagenase by the micro-organisms in the pockets. The school has a course of training of two years for dental hygienists.

The dental students are taught oral histology in their second year, and receive lectures on oral hygiene. They receive sixteen lectures on periodontology in their third year, and nothing beyond this. The time allotted appears rather small in comparison with that for other subjects—e.g., prosthetics, over 100 hours of lectures. Periodontology received, in all, 32 hours (including oral hygiene) out of a total of 1096 hours of lectures—about 3 per cent. The library, as was the case in several schools, was very deficient in non-American literature.

I next visited Baylor College of Dentistry, at Dallas, Texas. Periodontal teaching is carried out by Drs. Parks and Collings. Eleven hours of lectures are given on oral hygiene in the second year, and 33 hours in both third and four years. Emphasis here is placed on the more surgical approach in treatment, e.g., gingivectomy, flap operation. Problems of occlusal adjustment have not so far received much attention. The periodontal clinic is a fine room, with fourteen well-spaced chairs and units. The whole of this beautiful new school, with the exception of the library, is completely air-conditioned. As high temperatures are encountered in Dallas, this is very necessary.

After visiting Dallas I flew north to Colorado Springs. The temperature contrast was very considerable, the late evenings being decidedly cool. The countryside is wonderful, with Pike's Peak and other mountains only twenty minutes drive away. My visit here was to Dr. Orban's clinic.

This is a red-brick, single-storied building with a basement. There are about six surgeries, and the staff consists of Drs. Orban and Ritchey, and Downs, who is an exponent of the McCollum school, carrying out extensive rehabilitation work. There was also an hygienist or two at work and a well-equipped laboratory for two mechanics. The accommodation included an office for Dr. Orban, waiting-room, dark room, X-ray room, and in the basement a small classroom and storage space for teaching material.

Dr. Orban, together with other teachers, both in the fields of periodontology and basic sciences, holds post-graduate courses of two weeks' duration from time to time. These are very popular. Dr. Orban spends the majority of his time at his clinic, devoting a month or so a year to teaching at Loyola University, Chicago. The clinic is well equipped for post-graduate teaching, having some beautiful microscopes, equipment for microphotography, and a very considerable collection of human histological and pathological material. This is utilized also by the Colorado Springs Histopathology Study Club, which has a membership of over 100. Its members send in biopsy material, together with a case-history and a kodachrome slide, and receive a report on it after sectioning. If the case is of sufficient interest, slides are made for all the other members, who also receive a copy of the case-history, report on the slide, a copy of the kodachrome showing the clinical condition, and a commentary by Dr. Orban or Dr. Ritchey. I examined many of the complete records, and believe they are of the greatest value in post-graduate teaching.

From Colorado Springs I flew over the Rocky Mountains to San Francisco. Here I was the guest of Professor Harry Frisbie, who kindly arranged an interesting series of meetings with various faculty members. Unfortunately, Dr. Ray, Head of the Department of Periodontology, was absent owing to illness, but the influence of his teaching was obvious. He had worked with Orban for some time, and his teaching followed similar lines, I understand. I spoke to several senior students about cases they were treating, and was agreeably surprised at the grasp they showed of the problems concerned. The first lectures on periodontology are given in the second year (one a week) and similarly in the fourth year. Research was being carried out by Professor Becks, Head of the Oral Medicine Department, in a separate building, the Hooper Institute. He had nearly completed a beautiful atlas with photographs and radiographs of the normal and hypophysectomized rat at different ages, and has done some work on animals on the influence of pantothenic acid on gingivitis. The school is situated on a hillside, overlooking San Francisco, and is relatively modern. An enormous new wing is being

added, which will give considerable additional accommodation.

A point of criticism is the distance of the X-ray department from the dental clinics. It is housed in another part of the building, and is administratively part of the medical school,

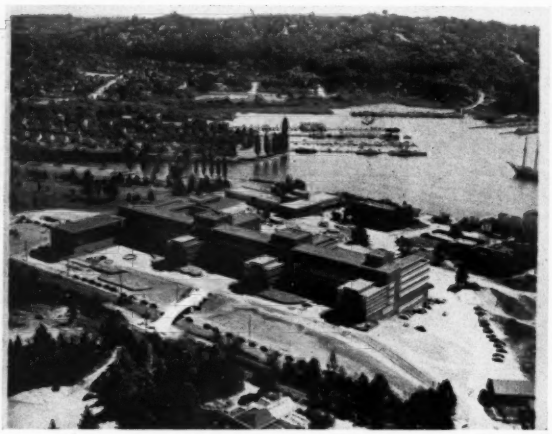


Fig. 2.—University of Washington Dental School, Seattle. The Dental Wing is at the left end of the building.

and obviously a good deal of time may elapse between a patient going for X-ray and his return.

The library is a fine one, being, in addition, the library for the medical and pharmacy schools, and is one of the half dozen best dental libraries in the States, I would think.

The other school in San Francisco is the College of Physicians and Surgeons. It originally provided facilities for training physicians as well as dentists, but this was discontinued in 1918, and since then it has been a dental school only. There is a fairly friendly rivalry between the two schools. The Head of the Periodontal Department, Dr. Lowell Peterson, was not at the School when I visited it, but kindly invited me to his office one day, where I watched him carry out a gingivectomy, using some of the Ward instruments, including the interdental saws, which, I understand, Dr. Ward calls curettes.

He told me an interesting story of Kerr's scalers. About 1912 or so, Kerr, an itinerant instrument vendor, was travelling around with sets of hoe-type scalers, in every possible size and angulation of head, and selling these together with a course of instructions on how to use them and cure pyorrhœa, for $500. Dr. Ward was, I understand, a "pupil" on one of these courses, and subsequently developed a technique of gingivectomy about 1920, designing instruments for the purpose, and also a special type of cement pack—"Wonderpak". In these he has undoubtedly made a big contribution to modern periodontology, although few people now carry out the original technique, involving, as it does, the removal or "curettage" of interdental alveolar bone. Other San Francisco periodontists I met were Dr. Agnew, and Dr. Dickson Bell, whom I had met in St. Louis.

From San Francisco I flew to Seattle. I had not originally planned this, but owing to the hospitality I had received I was a little in hand with the dollars and able to make the trip. This was well worth while.

My first morning there the Dean, Dr. Ernest Jones, told me of its organization and integration with the other schools housed in this building—medicine, nursing, and pharmacy. It is a beautiful modern building, situated on the University campus on a gentle slope just above the river, and is built in the form of a letter E (*Figs.* 2, 3). The dental building is built to withstand minor earthquakes! The main clinic walls are of glass brick construction with a central compound for autoclaving and patients' payments, and there is a cubicle system. There is a small two-unit room for gingivectomy and endodontia. On another floor is a beautifully equipped post-graduate clinic. Dr. Thomas is in charge of the periodontal department; I had already met him in St. Louis, where, in the absence of the programme chairman, he deputized with great success. He is a very keen periodontist, with an equally keen staff. The record chart he uses is done on the punch-card system; this

was the only school where I found this in use in a periodontal department, and as I happen to use one in my own department, we were much interested in each other's charts. There is a well-equipped photographic department at the school, and Dr. Thomas believes in the use of visual education in dentistry. A system of three coloured lines on the floors, leading up stairs to various departments, made it easy for the visitor to find his way.

From Seattle I flew back to New York, stopping at Minneapolis airport for breakfast, and covering 3000 miles or so in about twelve hours' flying time. From New York I went to Boston, where I was the guest of Dr. Henry Goldman for a fortnight (American: two weeks) during which time he was holding a post-graduate course at the Beth Israel Hospital. The course was held daily from 9 a.m. to 12 noon, 1 p.m. to 5 p.m., 6 p.m. to 9 p.m., including Saturdays, and was very concentrated. The first two days were spent on a fairly detailed description of the embryology, anatomy, physiology, and histology of the supporting tissues, terminology, and nomenclature. Following this came a consideration of pathology of the various periodontal diseases, aetiology, reattachment, instrumentation, occlusion, gingivectomy and gingivoplasty, scaling, curettage, splinting, selective grinding, treatment of the intra-bony pocket, and pockets involving the alveolar mucosa, frænum and muscle attachments.

Dr. Goldman was assisted by Dr. Chaikin, Head of the Periodontal Division at the Beth Israel Hospital (where Dr. Goldman is dental surgeon in charge), Dr. Bloom, Dr. Talkov, and Dr. Lewis Fox. The course provided a limited amount of practical experience for the participants; with twelve members on the course, simultaneous clinical work under supervision is naturally difficult to arrange to work smoothly. All lectures were illustrated by a large number of slides, in colour for clinical cases. Very beautiful results of treatment were shown, many being cases observed over a number of years, and with extensive filling in of alveolar bone, narrowing of periodontal membrane space, etc. Recently photography has been carried out by means of the Coreco camera, which has a built-in light supply. It gives good pictures, but very expensive—$800.

Fig. 3.—The Main Clinic Room at Seattle.

Periodontosis, Dr. Goldman says, is a degenerative disease, there being a globular degeneration of the fibres which stain unevenly and faintly. An increase in the number of indifferent fibres occurs. As soon as this takes place, occlusal trauma sets in—the stresses are the same but the support is weakened. The cause of the degeneration is unknown, but may possibly be a protein deficiency.

Dr. Goldman considers there are two possible mechanisms in the production of gingival clefts—in the one, a sheet of epithelium passes down bucco-lingually, the outer layers successively keratinize, and are shed; in the other the external, or gingival, epithelium fuses with the crevicular epithelium.

Concerning classification, Goldman lists periodontal diseases as follows:—

Inflammatory	*Dystrophic*
Gingivitis	Occlusal trauma
Periodontitis	Periodontosis
Ulcerative gingivitis	Senile and presenile atrophy
Periodontal abscess	Toothbrush abrasion
Herpetic gingivitis	Disuse atrophy

The dystrophic processes are usually complicated by inflammatory ones. Goldman finds that "altered passive eruption"—the condition in which, especially in children and young adults, the free gingival margin does not move apically at the same rate as the detachment from enamel of the epithelial attachment—is related, in a number of cases he has studied, to hypothyroidism.

In discussing occlusal trauma, he lists the following symptoms and signs: mobility, pain on chewing or referred to the temporomandibular joint, numbness, migration, fanning, centric of convenience, recession, intrabony pockets, facets on teeth, malocclusion, vertical alveolar loss, widening of periodontal membrane space, condensing osteitis.

Dr. Goldman considers that local aetiological factors are of relatively greater significance than systemic ones. He points out that local environmental factors are conditions predisposing to injury, and injury is subject to repair. Both injury and repair may be constantly repeated. If the repair mechanism is good, the terminal defect will be slight. The unknown factor is the individual resistance.

In discussing reattachment, Dr. Goldman states that it is necessary to remove calculus, ulcerated crevicular epithelium, and the epithelial attachment, and obtain the formation of blood-clot and thereby new connective tissue. He considers that nearly all clinical work done on reattachment was unsatisfactory, and as far as animal experimentation was concerned, the method of pocket creation was generally unsatisfactory and non-pathological.

The theoretical outcomes are: (1) Complete full-length reattachment; (2) No reattachment; (3) Partial reattachment; (4) No reattachment, but gingival recession due to resolution of œdema. He considers that (1) is impossible, (3) is possible.

Dr. Goldman, in discussing occlusion, states that he believes the rest position can change, while Dr. Thompson states that it never does. He points out that in mastication, occlusal trauma is probably not as important as in certain dysfunctional movements, e.g., bruxism. Manly has shown that the chewing pressure for the average food is about 10 lb. per sq. in. only, whereas in clenching and bruxism it may be very much greater. The role of the occlusion in periodontal disease may be a primary one, as in bruxism, clenching, etc., or a secondary one, in cases of existing damage to gingivæ and periodontium. It is therefore a factor of some degree—minimum or maximum—in all cases of periodontal disease.

Goldman emphasizes the importance of a long, bevelled cut in gingivectomy, and of restoring normal contour, with scalloping or festooning to give sluice ways. He lays much emphasis on the patient being left, at the time of operation, with a good gingival contour. The final "touching-up" is done with the electrosurgical loop.

For fixation, Dr. Goldman uses, for temporary splints, orthodontic band material of stainless steel, spot-welded at the contact points, with the individual bands lapped and welded on the buccal surfaces, contoured and cemented. This seemed an excellent, cheap, and rapid method of splinting.

I do not propose to discuss this valuable course further owing to lack of time. I would like to say here and now, however, that I consider Dr. Goldman's approach to periodontology, his philosophy of the subject, and his method of teaching, to be amongst the finest I have met anywhere. In addition to attending this post-graduate course, I visited two schools, having only a very limited time at each. At Harvard I saw something of the research work being conducted by Dr. Sognnaes; the equipment and animal experimentation facilities, already considerable, are being increased by the addition of a new wing to the rear of the building. Dr. Van Leeuwen kindly told me about the system of dental education there. The aim is to produce (1) dental scientists, (2) dental teachers, and (3) dentists. To this end, only 15 students are in each year's class. The main principles are that the basic technical training (e.g., phantom head work) is taught directly at the chairside; it is applied to the patient immediately it is taught. Efficiency in teaching is accomplished by:—

1. Complete equipment for each student.

2. Maintenance of this by trained personnel.
3. High teacher-student ratio.
4. Demonstrations of techniques to small groups.

Oral hygiene and prophylaxis technique are taught and carried out on patients throughout the 33 weeks of the third year. Lectures on periodontia are given during the first 16 weeks and instrumentation during the next 5 weeks, and clinical work during the next 11 weeks. Further clinical periodontia is carried out, as required, in the fourth year. It is still too early to assess the results of the Harvard scheme, which is a very great departure from orthodox dental training. For those interested, there are articles by Van Leeuwen (*J. dent. Educ.*, Jan., 1950) and Dunning (*J. Amer. dent. Ass.*, Jan., 1948).

The other dental school visited was Tufts. A private school, it is, I understand, housed in what was formerly a warehouse or factory. I saw rapidly over the building, and spent an hour or so with Dr. Glickman, in charge of Periodontology. The staff of the department is large—18 in all, on a part-time basis. Periodontology technique is taught during the second semester of the second year over about 14 hours, and about 56 lectures of one hour are given throughout the third and fourth years. Lectures are also given in periodontal pathology during the course of lectures in oral pathology. The student is required at the end of the fourth year to present a thesis analysing the cases he has treated.

From Boston, I went to Montreal, where it was snowing, although early for the time of the year. Here I visited both McGill University Dental School and the Dental Faculty of the Université de Montréal. The former, with Dr. Mowry as both Dean and Head of the Periodontal Department, is a private University, the latter being a State University. The staff members of the periodontal department include Drs. Walford, Gitnick, Harvey, and, recently, Sam Cripps, our Society's former President. The course is given to the third and fourth year students. In the third year there are demonstrations on prophylaxis, and seminars on clinical cases. In the final year there are 25 lectures and 60 clinical sessions. The latter follow on immediately after the former, so that the lecture material can be elaborated clinically. The class is divided into small groups (8) for demonstrations. These include the periodontal pocket, occlusal correction, use of packs, gingivectomy, and, of course, prophylaxis, although the latter is not listed as a separate demonstration.

At the Université de Montréal, a very fine school housed in a large building, which includes the medical school, Dr. Mowry kindly introduced me to Dr. Charron, the Dean, who emphasized that the dental course was designed so that the students continued to receive a liberal university education. Much importance is placed on encouraging art, and during the first year 60 hours are devoted to drawing. In the second year 25 hours of lectures are given, and in the third and fourth years 50 and 75 hours respectively, for clinical periodontology. In addition, a total of 155 hours during these two years is devoted to prophylaxis.

I talked for about half an hour only with Dr. Gendron, assistant professor in the periodontal department. He had, I believe, done a year's post-graduate work at Columbia University. In the second year techniques of curettage and occlusal equilibration on plaster models are demonstrated. In the third year students treat simple cases, and in the fourth year the more advanced ones including surgical techniques. The standard text-book is Miller's.

From Montreal I flew to Rochester. Here I was unfortunate in missing Dr. Bibby, who had to leave for Washington that day. I was shown over the Eastman Dispensary by Dr. Brunevald, and spent some little time talking with Miss Dewar, who was a member of a team of four (I have unfortunately forgotten the names of the others) working on the bacteriology of the gingival pocket, and demonstrating cleft-like lesions in biopsy specimens which were caused by a mucopolysaccharide, probably hyaluronidase. I also visited the medical school of Rochester University, where there is a further dental research group. I gathered that those at the Eastman Dispensary were working for their Master's degrees, but to obtain a Ph.D. it was necessary to work

within the framework of the University, i.e., at the Dental research unit at the Medical School.

Some interesting new work on the early stages of development of the tooth germ, illustrated by beautiful drawings, was being carried out by Dr. Avery.

My next visit was to Toronto, where I spent a rather longer period. I found I had just missed George Christensen, who had been there the week before, and had left a note for me. During this visit I met all the periodontal staff at a little dinner party, and subsequently was invited to tell them about my experiences in U.S.A. to date. The staff here were most friendly and kind to me, and I could not have been more warmly welcomed. I spent some time with Dr. Box, senior, both examining some of his extensive and fascinating histological material and seeing some patients under treatment at his office. He is using a chemical method of treatment of pockets at present with a substance called antiformin. Subsequent to removal with a curette of the black gelatinous crevicular epithelium resulting from introduction of antiformin into the pocket, he places a cement pack down to and over the edge of the gum margin, taking care not to force it into the pocket. He claims to get excellent results. Dr. Box is primarily concerned with periodontal research, while Dr. Williams, aided by Dr. McIntosh, is in charge of the undergraduate teaching. In the second year 10 hours of lectures are given together with 33 in the laboratory. The latter is largely related to the teaching of occlusal equilibration, which is much emphasized here and which Dr. Williams feels should be introduced at an early stage. In the third year there are 15 hours° of lectures, and 8 hours of clinical demonstrations, and in the fourth year a further 15 hours of lectures, and an unspecified amount of clinical work. There was obviously a great deal of importance attached to periodontology in the dental curriculum at this school, and I was left with the impression of a high level of knowledge of the senior students, together with their marked enthusiasm for this field of dentistry. I also met Dr. Linghorne working at the Banting Research Institute. He showed me some interesting slides of his work on reattachment, and stressed the importance of the need for particles of bone or cementum for alveolar reconstruction. At this Institute I was privileged, through Dr. Linghorne, to meet Dr. Best, of insulin fame.

Dr. Moyers, head of the Orthodontic Department, demonstrated temporal electromyography to me on a boy aged about 10. Some of the interesting applications of electromyography to the muscles of mastication have been published in the *Amer. J. Orthodont.*, Nov., 1949, and July, 1950.

From Toronto I went on to Ann Arbor, Michigan. I spent a brief hour with the Dean of the University of Detroit Dental School, and later at dinner met Dr. Quinn, head of the periodontal department there, and Dr. Downie. The Dean, Dr. Rochon, showed me something of the school, and forwarded me the available literature. It is a Roman Catholic School, i.e., conducted by the Jesuits, but is open to men of all religions. Sixteen hours of lectures on oral hygiene are given in the first year, 16 hours on periodontia in the second year, together with a further 32 hours of oral hygiene (half as lectures, half as practical work) and an unspecified amount of practical periodontia.

At Ann Arbor I was glad to meet Dr. Ramfjord whom I had last seen in Oslo a few years previously, and also Dr. Kerr, head of oral pathology and periodontology, whom I had met at St. Louis. The School is a fine modern one, and has a large main clinic room, very well equipped, on the cubicle system. I gained an impression that the periodontal department was somewhat short-staffed. In periodontal treatment, emphasis is placed on the chemical treatment of pockets, using various mixtures of camphor and phenol, and electrosurgery rather than plain surgery. Ramfjord, who had undertaken some interesting research on problems of reattachment in monkeys, was at the time devoting all his time to teaching. I saw one of the instructors checking a student's findings following his examination of a patient, and was interested in the meticulous thoroughness with which this supervision was carried out.

On to Chicago. Here, in all too short a time, I visited the University of Illinois Dental School, and for very brief visits, Loyola, Northwestern, and the Zoller Clinic. At Illinois I met Dr. Kesel, head of Periodontology there, Dr. Brodie, the Dean, and Drs. Schour, Massler, Weinmann, Engel, and Gratzinger. Dr. Kesel outlined the teaching of periodontology. I thought very well of the units and lay-out, but was not so enthusiastic about some of the periodontal instruments used. The old Black pattern hoes are far too large for most subgingival scaling, and Orban's explorer has too long a point. Dr. Weinmann showed me some recent research work in his department, the production of traumatic changes in the periodontium of rat molars following their forced separation by means of rubber dam. He also showed that tremendous cellular activity and mitosis occurred at a certain stage in the investigations. This work is as yet unpublished. Dr. Massler elaborated the P.M.A. count, and told me of his investigations into periodontal epidemiology. He also spoke of his work on different fluorine compounds.

Dr. Engel has published a series of papers during the last two years dealing with the connective-tissue ground substance. These are extremely interesting, and form a valuable contribution to the knowledge of the chemical changes that take place in the tissues.

At Loyola University I met Dr. Wentz, who, assisting Dr. Orban, is responsible for periodontal teaching. There is a fine collection of histological material there, much of it many years old, and formerly belonging to the late Dr. Gottlieb.

I had a brief afternoon's visit to the Northwestern dental school. Here I met the Dean, Dr. Freeman, and Dr. Lundquist, in charge of the periodontal department. I attended a lecture given by Dr. Lundquist, in which he was emphasizing the need for a careful study of occlusion in cases of periodontal disease, and of correcting it where necessary.

The Zoller Clinic, with Dr. Blayney in charge, is associated with the Hospital of the University of Chicago. The Clinic offers postgraduate facilities for men wishing to undertake clinical or laboratory research, and some fellowships are available to foreign dentists. No undergraduates are taken here.

My next visit was to Minneapolis, University of Minnesota. Dr. Zander, in charge of periodontology, had formerly been concerned with endodontia. He is enthusiastic over the film as a means of dental education, often replacing a clinical demonstration. I saw two films produced there, one on toothbrushing technique and the other on instrumentation for scaling and curettage. Both were very good films, made on the premises in the excellent photographic department. For those members here who are themselves teachers, I would add that I have a list of all this school's films, and another list of those shown at the American Dental Association Meeting; I should be pleased to loan these to anyone interested. The research facilities in the periodontal department in Minneapolis are as good as any I saw during the journey. Research at present being carried out includes an investigation into the effect of known forces applied for limited periods to anterior teeth of monkeys, an investigation into reattachment in humans (some slides I saw gave convincing evidence of the success of this) and, together with Hans Mühlemann, of Zurich, who is spending a year there, the production of a new instrument for measuring tooth mobility.

From Minneapolis I flew to Columbus, Ohio. This beautiful new school was shown me by Dr. Hamilton Robinson, the Acting Dean, and Dr. Wilson, in charge of periodontal teaching. A departure from the general practice of teaching is the utilization of instructors in all fields, with the exception of heads of special fields, who might be looked on as consultants. In addition to training dentists, there is a school for dental hygienists and dental technologists (= mechanics!).

To digress from dentistry for a moment. I was shown at Columbus what is probably the newest, largest, finest, and most luxuriously equipped student's Union in the U.S.A., and that is saying something. The Americans say that the British are somewhat sparing with superlatives; here, however, I feel I am fully justified.

From Columbus I travelled by train to Washington, D.C., where I spent a crowded five days. I visited two large dental hospitals —the Walter Reed Military Hospital, and the Naval Hospital at Bethesda. The dental officers in charge, General Snyder, and Captain Taylor respectively, were kind enough to show me over these magnificent buildings. There is opportunity at both hospitals for further dental training, in general and special fields, for dental officers in the armed forces. Each speciality was represented by an expert in that field, with well-equipped consulting room or office. Research and laboratory facilities were excellent. Many projects were being carried out on caries, chemistry, biochemistry, pathology, and so on. I gained an impression that the research worker who found himself in the armed forces would have facilities very much better than those in the majority of schools. I cannot pass from these two hospitals without saying that from the point of view of visual education the beautiful models, display cards, etc., in illuminated show-cases in the museum of the Naval Hospital at Bethesda surpassed any others I saw.

The Armed Forces Institute of Pathology is another remarkable institution. It has the following functions:—

1. It provides a consultation and diagnostic service in pathology for the Armed Forces and Veterans Administration, and, as far as practicable, other Federal and civilian agencies.
2. It conducts research into pathology of diseases of medico-military importance.
3. It provides specialist training in pathology.
4. It contains the American Registry of Pathology.
5. It operates the Medical Illustration Service.
6. It operates the Medical museums for the Armed Forces and lay public.
7. It houses pathological material from the Atomic Energy Commission.

The American Registry of Pathology has available for loan, free of charge, even overseas I believe, sets of histopathology slides, accompanied by a list of diagnoses, a syllabus or an atlas, in many branches of pathology. Those in dental pathology are particularly numerous, and include:—

Dental and Oral pathology—50 slides.
Kodachrome slides:—

1. Periodontal disease—100 slides.
2. Mouth diseases—100 slides.
3. Odontogenic tumours and cysts—100 slides.
4. Oral manifestations of systemic disease —100 slides.
5. Benign and malignant oral tumours— 100 slides.

Several sets of each are available.

Colonel Bernier is in charge of this Registry, and it was thanks to his kindness that I had the opportunity of seeing over and appreciating this unique institution.

Another interesting day was spent at the materials testing laboratory of the National Bureau of Standards. This is under the direction of Dr. Paffenbarger, who went to much trouble to show me what was going on there, and subsequently to send me many reprints of work published from the Bureau. There is first-rate equipment in this building, and much apparatus is especially designed for the job to be done. During the last thirty-two years more than 157 publications have emanated from this fascinating laboratory. Several dental officers of the Armed Forces were taking part in investigations there.

My last visit in Washington was to one of the two negro schools of the U.S.A.—Howard University. I was very cordially received by the Dean, Dr. Russell Dixon, a dental educationalist greatly and widely respected by the American dental profession. He kindly showed me round the school, and I had the privilege of meeting many of the faculty members over luncheon. A lecture in periodontology was being held while I was at the school, and I attended part of this. It was a good and well-presented lecture. After luncheon I was shown some of the University buildings, including that of the new dental school, now under construction. This is badly needed, the old one being very cramped. The new one will be one of the largest in U.S.A.

In Philadelphia I visited both Thomas Evans Dental School (University of Pennsylvania)

and Temple University School of Dentistry. My visits were all too short, but I was struck by the beautiful and comprehensive library of the former, and some excellent photography and use of visual education at the latter. Dr. Burket is in charge of the Oral Medicine Department, which includes the Periodontal Division, at Pennsylvania, and Dr. Rothner and Dr. Rosenthal at Temple. I spent a short time in Dr. Rothner's office, and saw some excellent colour slides of periodontal conditions. He and most other periodontists have a simple photography set-up which enables them to take rapid clinical photographs of high quality. These are taken routinely for every case, and are subsequently repeated as necessary.

I also visited the office of Dr. Foxman, whom I had met as a participant on Dr. Goldman's course. He specializes in oral rehabilitation; I saw several of his patients, some with completed restorations, and very excellent work it was.

New York was my final port of call. Here I first spent some days at Columbia University. This and New York University are, I believe, the two largest dental schools in the U.S.A. with classes of about 150.

Columbia University dental school is situated within a huge building, the Presbyterian Hospital, which has also a medical school. Periodontology is in charge of Dr. Beube, with some half-dozen or so colleagues assisting. All but one of his staff have the Certificate of the Board of Periodontology. This Board requires that a candidate should have spent so many years in periodontal study and practice following graduation, and certain two-year post-graduate courses are recognized for this. Each candidate has to present 8 case reports of cases which he has fully treated, together with an analysis of them. The requirements are exacting.

Dr. Leonard Hirschfield, son of Dr. Isador Hirschfeld, is also on the staff here. He practises with his father, and has made several valuable contributions to the periodontal literature.

In the second year, 10 hours of lectures in periodontology are given, and 44 clinic hours; in the third year, another 30 clinic hours, and in the fourth year, 20 hours of lectures, and 30 in the clinic. Goldman's text-book is recommended (perhaps I should say was, as Dr. Beube is himself writing a book at the moment!) and Dr. Goldman and his colleagues at Boston meet the periodontal staff of Columbia from time to time at seminars, so that both groups are fully conversant with each other's work. Incidentally, Dr. Glickman will probably by now have completed his text-book on Periodontia, and Dr. Goldman is bringing out a new edition of his work.

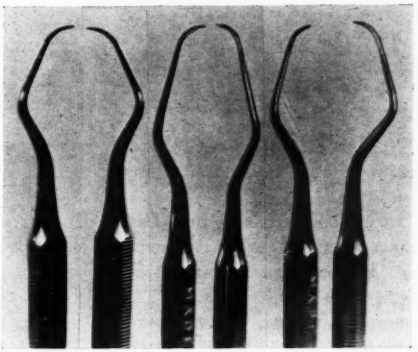


Fig. 4.—McCall's curettes, Columbia University modification.

The instruments in use at Columbia were, I thought, as nice as any I had seen. They use the McCall pattern hoe scalers, and their own slight modification of the McCall curettes, as manufactured by Ivory, together with some nice files designed by Hirschfeld, and of the same pattern as the McCall hoes. I brought back some of these, and illustrate them here (*Figs.* 4, 5). Members will be glad to know that these curettes and files are now obtainable from The Amalgamated Dental Company.

At New York University I met Dr. Miller, who is in charge, Dr. Sorrin, Dr. Blass, and many others. All those I met were most kind in giving me the information I required. The staff of this one department numbers over 30; most of the lectures are being given by the younger members of the staff. The School is hopelessly overcrowded, and it was quite difficult to weave one's way in and out

amongst the chairs, but a new building is planned and, I believe, soon to be built.

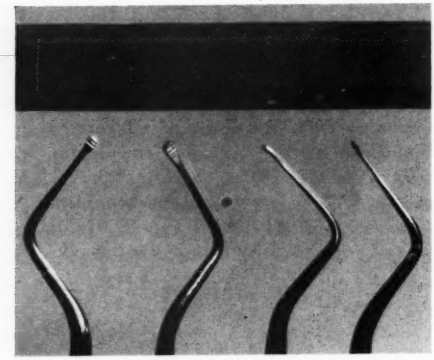


Fig. 5.—Hirschfeld files. *Above*, knife-edge file to sharpen these files.

No laboratory research was being carried out, as far as I remember, at either of these two schools.

In addition to meeting those periodontists who are at present actively engaged in teaching, I met many others who were wholly engaged in private practice. At St. Louis, for example, I met all the executive of the American Academy of Periodontology, and also Drs. Kirkland, McCall, Leonard, Coolidge, Edgar James, and Merritt. In New York I was privileged to meet again Drs. Leonard and Merritt; I spent the afternoon at Dr. Merritt's home, and saw his wonderful collection of china. I also met Dr. Hirschfeld and his son. I had met Dr. Isador Hirschfeld for the first time in London, during the International Congress. Some of you may remember that he then showed some cases which he had had under his care for 25 years—the results were beautiful. When I visited his office in New York I understood why. He has a very meticulous and thorough technique, and his system of record-keeping is a model one. He gave a cocktail party at which almost the entire staffs of Columbia and New York Universities were present, and later showed some of us his unique collection of toothpicks, which come from all over the world.

I was given a large number of reprints of publications, and also received the bulletins setting out curricula, courses, etc., from a number of schools. If any members of the Society are especially interested, I would be glad to try and answer any queries or forward information.

In conclusion, I must express my very deep gratitude to the many American and Canadian friends and colleagues who took the time and trouble to show me the things I wanted to see, and whose hospitality, both inside and outside their own homes, was overwhelming. I would also like to express publicly, as this is my first opportunity to do so, my indebtedness to the Nuffield Foundation, and my grateful thanks to its trustees for enabling me to undertake this invaluable study tour.

PREPARING AND ALSO SPARING THE ALVEOLAR RIDGES FOR DENTURE SERVICE

DESPITE the present popularity of immediate denture placement after surgery, the indication for delayed ridge preparation exists when severe loss of alveolar bone has occurred previously, or when there is slight skeletal formation. Excessive removal of mucoperiosteal tissue should be avoided, for any trimming necessarily means removal of the toughened tissue adjacent to the gingival margin, leaving more sensitive areas of gingiva for future denture support. Excessive mucoperiosteal removal may tense the mucobuccal deflection, which will cause dislodgement of an otherwise firmly fitting denture. Excessive reflection of the mucoperiosteum creates unnecessary trauma and consequent discomfort, and should be avoided.

Every effort should be made to retain the cortical structure of the maxillary tuberosities, and various methods for accomplishing this are indicated.

A detailed description is presented, of the hazards to watch for in surgical removal of either a lingual or a palatal torus. The steps in removal of the bony eminence, sometimes present after extraction of a lower third molar, are outlined.—WAKEFIELD, B. G. (1952), *Ann. Dentistry*, **10**, No. 9, 89.

Issued with "The Dental Practitioner", March, 1953, Vol. III, No. 7

RADIOGRAPHIC CHART No. 10.

PARODONTAL DISEASE

Case 1. — Parodontal abscess on $\underline{|8}$ involving apical tissues. Tooth extracted.

Case 2.—Deep pocket around $\underline{6|}$ with loss of bony support. Small pieces of subgingival calculus may be seen in the distal pocket.

Case 3. — Parodontal disease showing loss of bone and deep pocketing around the premolars. This case is under treatment.

Radiographic evidence of parodontal disease is important. It is only by this means that the amount of bone loss may be estimated. The three cases illustrated above all gave rise to pain, and the treatment really depends upon the radiographic findings.

OFFICIAL SUPPLEMENT OF THE

SURGICAL INSTRUMENT MANUFACTURERS' ASSOCIATION (INC.)

DENTAL LABORATORIES SECTION

Chairman : E. G. EMMETT, F.I.B.S.T.
Administrative Offices : 6, HOLBORN VIADUCT, LONDON, E.C.1
Telephone: CITY 6031

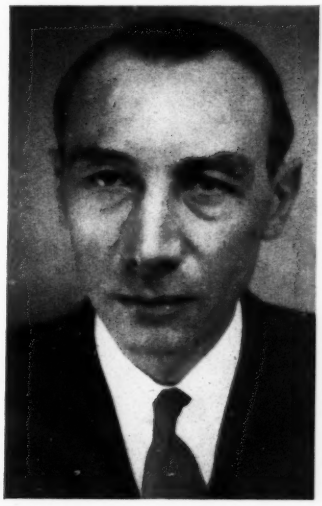
Vol. II, No. 12 March, 1953

Editorial Committee: D. M. BEAUCHAMP; H. J. POTTER, F.I.B.S.T.

EDITORIAL

FRIENDSHIP among competitors is an idea still strange to many in the world-wide dental laboratory industry, yet some in all countries have been treading the road of thought interchange, co-operation, and mutual help for years.

M. Emile Leenen, Président de l'Union Nationale des Laboratoires de Prothèse Dentaire (Belgique).



M. Jean Oosterbosch, Vice-Président de l'Union Nationale des Laboratoires de Prothèse Dentaire (Belgique). Secrétaire provisoire du Bureau Internationale de la Prothèse Dentaire.

The French laboratory president has three employees, the vice-president ten; they both operate in Paris, and both joined together in a visit to London as soon as an opportunity offered. The Belgian president operates in Antwerp with a staff of twelve, the vice-president in Liege with his partner and an establishment of fourteen; both are interested in international federation—indeed the latter has voluntarily undertaken the task of making contacts with foreign associations, and his voluminous letters of information about conditions in Belgium, and the many queries

concerning dentistry in Britain, are convincing evidence that Europe has the right man for this work.

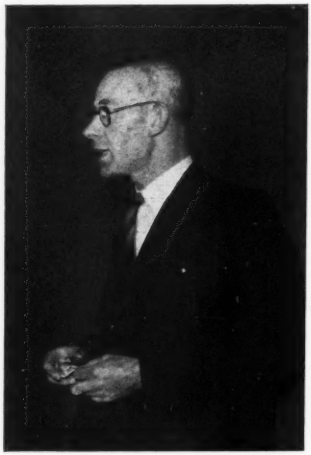
The display at our last Summer Conference, during the International Dental Congress, of the concord existing between R. J. Rothstein, a big man employing one hundred and fifty in Washington, and Duncan Marshall, a smaller man employing fifteen in Detroit, was very satisfying to all laboratory owners who are anxious to see such examples of friendship increase in number.

In our own country the harmony existing between S.I.M.A. members who have many employees, and those who have none, seems an indication that a sound foundation is being laid for an influential laboratory association, based on the desire of service of the highest standard to the dental profession.

It is the intention of the British group, not only to produce work which is good, but to make it possible for others to do so. All dental laboratory owners should reflect on the generous willingness of our members to share experience and discovery. In that spirit an increase of friendship must be brought about, and it is only in such a spirit that friendship may be continued.

ACRYLIC-LINED STAINLESS STEEL DENTURES

MR. G. A. Fuller, a member of the Institute of British Surgical Technicians, made an excellent contribution to the table demonstration meeting at Norbury last October.



Mr. G. A. Fuller giving his talk.

The method described and illustrated is deserving of more popularity than it has so far received. The subjects of the photographs were made specially to accompany the lecturette and revealed much care taken over details. The following account of the technique will be a valuable guide to those constructing such a denture for the first time.

The technique to be described is not new, but one which seems to have lapsed with the passing of years. It has for its object the creation of an upper denture with a thin palate, combining the strength of a metal plate with the adaptation of an acrylic surface.

Its use is quite plainly indicated in a number of cases. One such case is the constantly fracturing upper, due to the positions of natural teeth left standing in the lower jaw. There is also the case of the patient asking for a metal plate, probably because a friend has one, when the close fit and adaptation of an acrylic palate is indicated.

The first step is an accurate impression; this is important and must be stressed, because one of the later stages described suggests that the accurate impression may now be by-passed: it is not wise to do so if a perfect result is desired in the finished case. From the impression a model is cast in stone.

Metal dies and counter dies are prepared to the model. The method of obtaining these will not be described as most of us are familiar with the details. A piece of stainless steel plate of thickness gauge 4 (0·01 in.) is adapted to fit the model either by means of a press or by hammer striking.

When the stainless steel is accurately fitting the model a piece of thin stainless steel gauze of mesh 60 wire 37, large enough to cover the palate, is welded down the centre of the palate on the fitting surface. This is roughly adapted to the die, and then welded to the plate with as many welds as possible. Great care should be taken to make a continuous weld along the back edge of the gauze, which should be 2 mm. short of the back edge of the plate. This is important, as it prevents the ends of the wires composing the gauze from protruding through the finished acrylic.

The plate is then finally fitted to the die: beading and retaining tags are added in the usual manner. The plate is then stoned and polished through the various stages, until a brilliant surface is obtained: this is most important so as to obtain the full benefits of stainless steel.

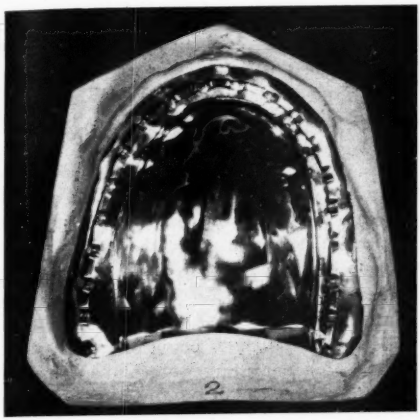


Fig. 1.—Stainless steel palate pressed, gauze welded on reverse, beaded, tagged, and polished, ready for teeth to be mounted.

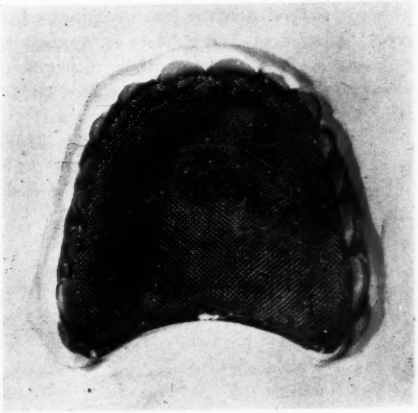


Fig. 2.—Plate pressed. Case tried, invested, boiled out, impression paste lifted cleanly from wax filled gauze: note the gauze trimmed 2 mm. short of plate margin.

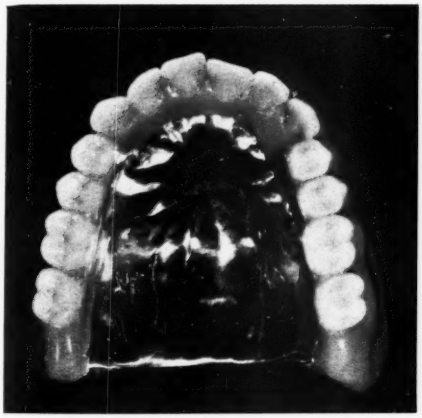


Fig. 3.—Finished denture, lingual surface.

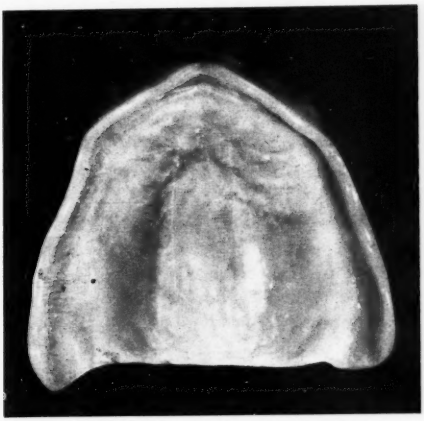


Fig. 4.—Same denture, palatal surface; influence of gauze may be seen.

The teeth are now set up, but before trial in the mouth, molten wax is run well into the gauze, making sure that all undercuts are filled but that no wax is left above the gauze; the reason for this procedure will be seen in a few moments.

When the trial denture has been passed as correct, a layer of lining paste is applied to the fitting surface, and the plate returned to the mouth for a final accurate impression. This stage may be omitted if desired and the denture finished to the accurate model which has already been worked to, but the extra trouble is well worth while to obtain a muscle-trimmed periphery.

The pattern denture is then invested, with the model in the lid of the flask, and on boiling out it will be seen that the wax in the gauze will have prevented the paste from running into the gauze, so that it may be removed quite easily. If the bite is close, the metal palate may be removed from the flask while packing acrylic against the teeth. The beading will give the palate a definite location against the plaster matrix. The mould is then filled and dough placed over the gauze of the plate. Close and re-open the flask as necessary, but before the final closure, place a relief on the model over the hard area.

Slow processing and bench cooling are strongly advised, not through any fear of warping, but to allow the metal and acrylic to accommodate each other. When cold, remove from the flask and finish in the usual manner.

The completed denture will have the strength of a stainless steel palate, the fit of an acrylic denture, and a palate no thicker, and probably thinner, than that of an acrylic denture.

This method may also be used for partial dentures, particularly if there is a likelihood of the remaining teeth being lost fairly soon, and the case becoming edentulous. In such partial dentures it must be remembered that the gauze must be kept back from all edges by the 2 mm. mentioned earlier.

SWEDON SELF-CURING ACRYLIC

On Thursday, Jan. 22, 1953, a lecture and demonstration was arranged by Messrs. Henry Courtin under the auspices of S.I.M.A. at the Eastman Dental Clinic, Gray's Inn Road.

Mr. Emmett, as Chairman of the Dental Laboratories Section, welcomed those present on behalf of the Association, and first introduced Mr. Marcel Courtin, who made the following remarks:—

"Mr. Chairman, Ladies and Gentlemen: The remarks made by your chairman in regard to my Company are appreciated. It is my earnest hope that the demonstration of "Swedon" cold-cure material which you are about to witness will show you the great strides made by the Svedia Dental-Industri of Enköping, Sweden, in this field.

"Dr. Rydberg, of Stockholm, was to have been present, but he has been unfortunately prevented from coming at the last moment, and we only learnt of this fact a few days ago. We were fortunate in being able to turn to our friend, Mr. K. W. Houghton, of Messrs. Cottrell & Co. who has probably done more work in connection with cold-cure dental materials than anyone else in the country, and surely can be classed as an authority on the subject. He kindly agreed to step into the breach this evening and give you the benefit of his knowledge. I trust that you will enjoy Mr. Houghton's talk, and he and I will be at your disposal for questions at the conclusion of the demonstration ; I now hand over to Mr. Houghton in order that precious time is not lost, as I know many of you will have come from the Home Counties and the Provinces, and no doubt will wish to be sure of catching your trains later on this evening."

With his opening remark, Mr. Houghton said that he did not wish it to be thought

that he considered himself an authority on the subject of self-curing acrylics, but he then proceeded to prove that he had a vast experience and sound knowledge of the subject. His first experience in the use of these materials dated back to November, 1949, since when his interest had steadily increased, until now he considers that there is a place in every dental laboratory for a packet of a good self-curing acrylic. Mr. Houghton here emphasized the point that a self- or cold-curing acrylic is one which requires no form of external heat to bring about polymerization. To quote, "It is immaterial to me whether a denture is cured at 37° C. for 4 hours or for 94 hours at 1° C.—so far as I am concerned it is not self-curing".

He told us that although these materials are a relatively new introduction to the British market, it is known that the Germans were experimenting with them in 1940 and that various makes had been in use on the mainland of Europe and in the United States for a considerable time. It is his opinion, he said, that we shall hear much more about these materials in the future and their introduction probably heralds a new era in dental acrylic resins.

Here Mr. Houghton proceeded to enlarge on the advantages and disadvantages of those self-curing resins available on the home market before enumerating in detail the properties of "Swedon," and made the point that as a technician demonstrator, he did not wish to concern himself with the use of these materials as a filling material or as an impression material for rebasing dentures, but wished to confine himself to their use as a denture base or repairing agent, and enumerated the following six points:—

1. The complete absence of external heat during the repairing process completely eliminates the risk of strain relief, warping, or other dimensional change in the denture. This statement can be accepted as it stands as being fairly obvious. On the other hand, most technicians know to their cost that it is no easy matter to re-cure a denture without it undergoing any change whatsoever.

2. In the case of dentures, it is claimed that the amount of contraction during curing is less than in the case of a hot-cured acrylic, but he had no information to suggest that this was of any practical significance.

3. There is a great deal of time saved in effecting repairs and even in making dentures. It has long been possible to carry out certain simple repairs without pressure and without even flasking them, and he proposed to show later that it is now possible to do a wide variety of repairs in this way. In the case of a denture, the entire curing cycle, including the cooling down period, is completely eliminated. Instead of all this lengthy, perhaps overnight, procedure, the denture is ready for deflasking 20–30 minutes after the powder and liquid are first mixed. Certain simple partial dentures could be constructed without even the necessity of flasking.

Mr. K. W. Houghton.

4. Immediate dentures of an urgent nature could be made at very short notice indeed.

5. Relining or rebasing can, it is claimed, be effected without the need of flasking or curing, the acrylic being used for the impression and then allowed to polymerize at mouth or room temperature.

6. There is not the remotest possibility of bleaching or change of colour in any make of teeth employed either on a denture or a repair, owing to the total absence of heat. The importance and significance of this must be apparent to all.

Mr. Houghton then showed a large and varied assortment of repairs and dentures, both partial and complete, for which he had used "Swedon" and gave details of the technique he has developed.

It is manifestly impossible to do justice to a demonstration in a short report, nor is it possible to illustrate the many examples shown, which included repairs of all kinds, complete fractures, partial cracks, additions of teeth and clasps, extensions of post-damming, and even a repair incorporating a fibre-glass laminate in a single operation.

Salient features of technique are that there is no need to flask a denture for repairs, and although no pressure is needed or used since the material is "run on" in an extremely fluid state, no porosity results.

A repair or denture can be built up in layers with succeeding mixes, and it is astonishing that dentures made in this way were demonstrated which although left dry have shown no dimensional change or warping, whereas those made of hot-cured acrylic at the same time and to the same models and subsequently left dry have lost all semblance of fit.

In conclusion, Mr. Houghton stated that his only reason for not advocating the use of Swedon for large permanent dentures was simply that at this stage he is not in possession of sufficient data.

At the end the audience was invited to ask questions and it was very apparent that the lecturer had gained and maintained the interest of a well-attended meeting.

A vote of thanks proposed by Mr. C. M. Booth from the floor, was most enthusiastically supported and applauded.

Note.—The Supplement Editors believe that Dr. S. A. Leader was the pioneer in England, if not in Europe, of all the recognized advances in acrylics offered to dentists from 1939, dentine for teeth, Filcryl fine powder for direct fillings in teeth, and latterly the Fibercryl laminates.

Preceding the above lecture a demonstration of the Dentatus Articulator was given by Mr. Houghton, by whom the technicalities of the subject were very lucidly explained and illustrated by a number of slides. Further details will be published in a later issue.

NEWS FROM THE BRANCHES

Birmingham and District.—At the well-attended Annual General Meeting held at the Chamber of Commerce on January 21, Mr. G. E. Cross was elected Chairman, Mr. A. Gardiner Vice-chairman and London representative, and Mr. Geo. Taylor Secretary. The committee is comprised of the above, strengthened by Messrs. A. Brown, W. Fletcher, and F. Simpkin. Educational matters in the hands of Mr. Peter Davies.

West of Scotland.—The Annual General Meeting was held on January 18, when officers and committee were re-elected. The chairman, Mr. Marshall, in his review of the year, hoped that the future trends must be upward as they could not go much lower. Mr. Reid reviewed the work done at headquarters, and pointed out that because of the quietness in the craft, it was imperative that we of S.I.M.A. remain united, and where possible add recruits to our ranks. The West of Scotland branch send their greetings and best wishes to all the other members.

Meetings regularly on the third Monday of each month.